

THE EUROPEAN ACTUARY

QUARTERLY MAGAZINE OF THE ACTUARIAL ASSOCIATION OF EUROPE



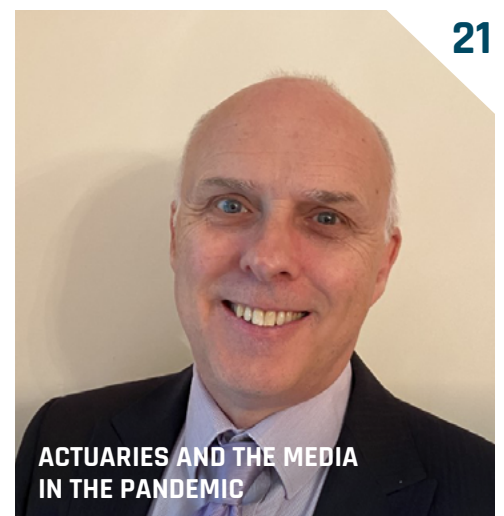
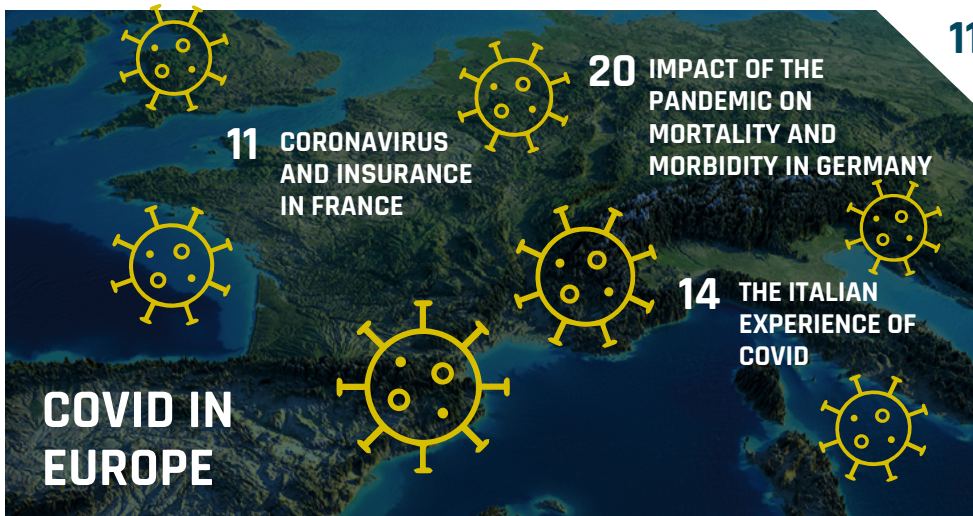
LOOKING AHEAD



FORECASTING NATCAT RESERVES



INSURANCE OF ELECTRIC VEHICLES



ACTUARIES AND THE MEDIA IN THE PANDEMIC



LOOKING AT GOOD GOVERNANCE



SUSTAINABILITY AND CLIMATE CHANGE: MAIN POSITIONS OF THE AAE



AAE NEWS:
AAE-BOARD MEMBER:
MATTHIAS PILLAUDIN

N° 29
MAR 2022



LOOKING AHEAD

Petra Hielkema took up her five-year term as the Chairperson of the European Insurance and Occupational Pensions Authority (EIOPA) last September. Prior to this, she was director for insurance supervision at the Dutch central bank, where she was responsible for the prudential supervision of the Dutch insurance sector. Now, after six months in the job, she looks to the future and what's needed in the sector.

INTERVIEW BY
JENNIFER BAKER

2022 will be the decisive year for the review of Solvency II. How do you assess the EU Commission's proposal for the review as we have currently on the table?

'Indeed, a very important year for Solvency II, and I think we're off to a good start. Because overall, we at EIOPA like the proposal that the Commission has put on the table. Specifically, we're very happy with the proposal to develop an Insurance Recovery and Resolution Directive. And also to include a macro prudential perspective in Solvency II. It was one of the three

ambitions we had, and we're happy to see that back in the proposals of the Commission. Moreover, we're pleased with some of the sustainable finance items that are now introduced in Solvency II. They were already there in the renewed sustainable finance strategy of the Commission, but they will now also find a place in insurance supervision through the Solvency II review which we welcome.

Maybe there are also some concerns in the Solvency II proposal as it stands now, I think in particular we very much miss wording on an IGS - insurance

guarantee scheme, which we feel is very important to have. If you allow through passporting, the sale of insurance products through the entirety of Europe to all European consumers, then we would expect that those consumers are protected equally. And in the absence of a minimum harmonised insurance guarantee scheme, that is currently not the case. Finally, in the core role, as prudential supervisors, we do have some concerns with the proposals on pillar one. In general, we feel that indeed, there is room for long-term investment, to look at the possibility to adjust the capital requirements a bit in >



PETRA HIELKEMA

order to also enable those long-term investments and recognise that long-term character. However, the current proposals in scope go way beyond long term, and that is a concern. But we stand ready to discuss that with the political level in the year to come.'

The Actuarial Association of Europe and many national actuarial associations see problems in the new extrapolation method for the yield curve. Why does EIOPA want to make a profound change here?

'That's a good question and it's something we discussed a lot. You have to keep in mind the way the Solvency II framework was developed and all the delays between 2012 and 2014, and then only introduced in 2016. Now in those times the market, the economic environment, was completely different than what we see now. We even see negative interest rates. Even now with a new environment, developing with inflation rates, still, the yields are very low. And what we wanted is a reflection in the framework of that economic environment. So we have proposed a slight adjustment to the extrapolation to actually reflect that these low yields are a

reality that, particularly if you have products that are very long term, that are guaranteed, they have become more expensive. Now, the way we do that, I think is not a revolution, it's an evolution. But it is a slight adjustment and overall, I think it's an improvement of the framework that in the end has to provide reliability and robustness.'

You spoke in favour of integrating sustainability risks into Solvency II. How do you envisage this in detail?

'Well, what we see is that in Autumn 2021, in the proposal that was done by the Commission, >



However, the current proposals in scope go way beyond long term, and that is a concern. But we stand ready to discuss that with the political level in the year to come.

they actually add two things to what we already have. And what we end up with is the ability to ask insurers to include sustainability risks in pillar two. What we now see is two additional changes to the framework proposed. The first one we welcome it's a recalibration, a reassessment, of the natural catastrophe (Nat Cat) risk module every two years. I think that's fair. We are looking into Nat Cat, of course, but I think given the fact that this is very much developing, and we're getting more and more data, it absolutely makes sense to revisit natural catastrophe risk module, look at it and assess if it's still appropriate every two years. So I think that's an important change.

A second important change – and I think, still a challenge for ourselves – is that we've been asked to assess whether or not risk differentials will be appropriate in pillar one. In other words, should there be a green or a brown factor in pillar one? Now in 2018 EIOPA has shown that we can do such an assessment and then conclude that based on the evidence we have, we do not see any appropriate reason to make changes to the framework. We often get the question, will you be doing such an assessment evidence based? Yes, we will. And we will only propose changes if we

see the evidence in the data. We will not limit ourselves by doing that assessment only on the asset side, but also look at underwriting, for insurance also has a very important role, I would say in sustainability, as an underwriter of society's risk. I think all in all, it's a good addition to our framework, it reflects the risks that are there. But, let me say it again, it's done in an evidence-based, risk-based manner.'

Well, I know that you have in the past expressed concerns about the sustainability of the European pension system because of the demographic change. Tell me a little bit more about your pension dashboards and tracking services and how they will address this?

'Yes, so in the second half of last year, we actually came out with two pieces of very well written advice to the Commission on a pension tracking system and a dashboard. These are both tools that can help member states to assess where and whether they have a gap in the savings for pensions for their population. The first one, the pension tracking system is actually an individual tool. The idea is that every citizen can go online to the tool, and then gets an overview of what

he or she has saved so far. And what that means for the future in all three pillars of pension – so in the public pensions, in the pillar two - occupational pensions, but possibly also independent free pensions saved through insurance products. And with that we hold that people get inside in possible gaps they have and take action going forward.

The same holds for the dashboard, which is actually for the member state. It gives an overview at the national level of where the member state itself is with its saving for later. We feel both tools are very much needed. And we look forward to hearing from the Commission on how to go further now that they have received our advice. Because the numbers show that one in five European citizens is currently not saving enough for retirement. And that indeed is a concern to us.'

Another element is the Pan European Personal Pension Product (PEPP), which has so far met with little response. According to your analyses, what is the reason for this and how can the situation be improved?

'Well the PEPP, which has so far met with little response, has been >



And we look forward to hearing from the Commission on how to go further now that they have received our advice.

developed, and in spring it will come to life. What we have done is we have asked asset managers, insurance undertakings, banks, institutions that provide occupational pensions, if they are planning to actually offer a PEPP? We received 167 responses from 19 countries, and one third of the respondents came from asset management, one third came from insurance, and 10% came from banks and according to this survey, 18% – 30 respondents – said they would offer a PEPP. 31 respondents were still considering it, and 51 said they were not planning to offer a PEPP.

Now, that survey is two years old, so we're currently doing another survey to see where we are, but I think it's too early to have any conclusions on whether or not it will be a success. Having said that, I do hope it will be a success because I think it adds to the choice for consumers on how they want to save for their pension. It's a product that, if offered, helps people to save for later in addition to what they already do. So it could fill a gap, but it also enables people if they work in several member states to bring their pension with them. And it is open to anyone: people who are self-employed or people who change job quite often. This product will just be a stable product that they

constantly save into whichever job they have, whichever member state they work in. As such, I do hope it's a new feature in the market for saving for later. And I very much hope it will be picked up because I do think it adds value.'

Well, finally, EIOPA recently presented its seven sustainability objectives. What contribution can the insurance industry make to achieve the EU's 'Fit for 55' target?

'The Fit for 55 has this target of at least 55% emission reduction by 2030. It's very ambitious. But moreover, it is very necessary. And I think we are working at EIOPA, but I do see also in industry, working very hard to support it. That's the first point. I also think we need to be conscious of our own operations, insurers have to be conscious of their own operations and how sustainably they operate in a world that really needs companies to think about that. What is the impact of the decisions an insurer and pension fund makes on the environment? And at the same time, what does climate change do from a risk perspective with their own balance sheets, and in the case of insurers, also with their liabilities? Now, particularly for insurers on

the liability side, there is an even bigger opportunity to support this transition. When offering insurance, recommendations or even conditions could be made that will facilitate or incentivise a transition to more sustainable ways of operating a business that wants insurance or behaviour of consumers. How EIOPA is in practice supporting this is that, for example, we are now conducting a pilot exercise with a lot of insurers volunteering, and assessing how difficult or not difficult it actually is to underwrite these risks, particularly in the field of climate change. For example, with the disastrous flooding in Germany, Luxembourg, Belgium, Netherlands, we saw that only 30% – a little bit less even – of consumers in Germany had taken out cover, and that was available to deal with the damages of this flooding. So why did they not do that? Are other products needed? And how can insurers underwrite these risks? We're assessing all this, on one hand with the insurers, but also on the other hand, in a behavioural study with consumers. We hope to present the results before summer. And we hope that all this will feed into the discussion on how, through incentivising through adaptations, we can actually make the transition to a more sustainable economy.'



A SHORT NOTE ABOUT **FORECASTING** NATCAT RESERVES USING THE **CIR²** MODEL

BY **GIUSEPPE ORLANDO**
AND **MICHELE BUFALO**



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In this note we highlight some features of the CIR² model we have developed, which is a generalised two-factor square root model (i.e. a model where, under certain conditions, both losses and volatility are positive and where volatility increases with the level of loss). In the framework we present, calculation of the mean and variance of loss are correlated processes; this is a new theoretical approach, and difficult to implement insofar as there are no closed-form solutions. This methodology is designed primarily for use by insurers and reinsurers that need to avoid high variation in their reserves; however, it could be extended to apply to any business that is exposed to extreme events and aims to preserve a stable cash flow to shareholders. In fact, though generalised linear models are common instruments in the pricing of non-life insurance contracts, they are inadequate for extreme claims. As such, the suggested model could be helpful for pricing in this instance.

Traditional techniques used to model the cost of natural catastrophes for insurance purposes apply probabilistic approaches, usually based on: geographically situated assets (e.g. density of population, houses, activities, infrastructure, etc.); damage functions that translate the impact into economic losses; hazards such as floods and earthquakes; and adaptation measures (e.g. seawalls, improved building codes, etc.). >

This approach may result in accurate estimates, but the granularity and volume of data it requires presents practical problems – in particular the difficulty of obtaining information spanning an extended time series.

Our alternative approach, which borrows from econometric analysis, uses a model that can analyse a single time series to not only predict losses themselves, but also their volatility. Considering volatility as a factor is of key importance, because NatCat activity is widely variable and occurs in non-Gaussian distributions; these characteristics also mean many sophisticated

models give flawed results while simpler models – such as autoregressive or moving average (MA) – are more successful.

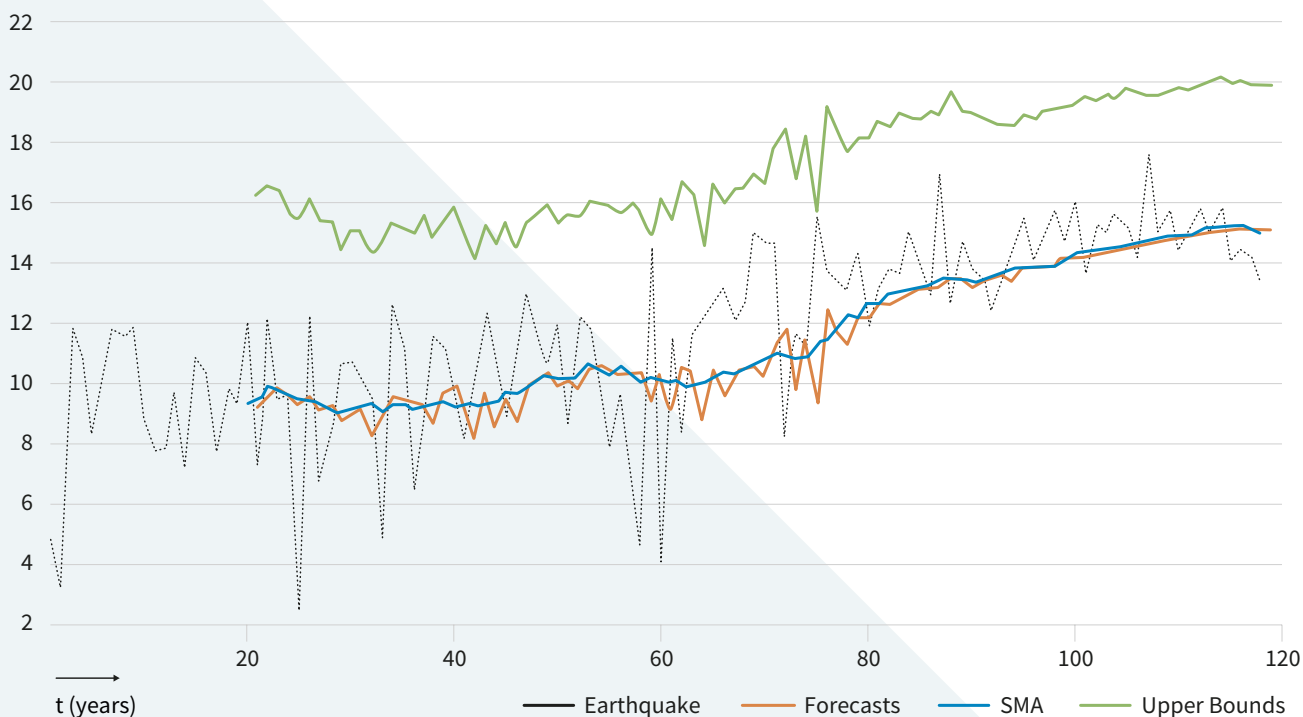
Furthermore, to protect the company against exceptional ‘bad’ years, the model needs to be able to provide a reliable estimate of the maximum loss, and classic Value-at-Risk (VaR) approaches are not adequate for this. From the numerous models suitable for such an estimation, we have chosen a General Pareto Distribution (GPD) to calculate an upper limit for the maximum expected loss. The resulting estimate represents ‘our’ value at risk and is referred to as VaR_{GPD}.

To conclude, we demonstrate the accuracy of our results and the validity of the model by means of backtesting, using Kupiec (POF), Christoffersen (CC) and TUFF/TBFI tests.

The CIR² parameters are first calibrated over a ‘training’ period, after which expected loss, volatility and maximal loss are regularly forecasted over a given horizon. Estimates are available with horizons of 1, 5, 10 and 15 years. *Figure 1* shows an example, with the log losses of the natural disaster (dotted black line) displayed over a time series of 120 years with a 1-year horizon. For calibration here, we used a rolling >

FIGURE 1: EARTHQUAKE FORECASTS

The dotted black line shows the log losses of the natural disaster X_t ; the blue line is its (ex-post) SMA; the orange line represents the corresponding forecasts x_F ; finally, the green line refers to the upper bound VaR_{GPD}. Out-of-sample forecasts.



20-year window to estimate the first triplet of values representing loss, volatility and maximal loss for the next year. Iterating this procedure through the full time series (120 years long) produced forecasts for the remaining 100 years. NatCat loss behaviour is rather erratic and difficult to anticipate, but insurers need to make estimates of the expected cost for a selected horizon. Shown in blue on the graph, the simple moving average (SMA) is calculated based on actual occurrences. The red line represents our forecast values, along with the upper boundary in green. For this last value we used the VaR obtained using the GPD method mentioned above. The graph shows that the CIR² forecast line is not only fairly

close to the ex-post SMA but also, with a single exception over the whole period, is always above the peaks of actual losses realised.

As well as the data represented in figure 1, we also applied the CIR² model to 5-year, 10-year and 15-year horizons and analysed the resulting forecasts against actual results (see figure 2).

For the 1-year horizon, all forecasts were out-of-sample. As expected, the longer the horizon, the higher the error. However it should be noted that although for drought the error is almost 50% higher when comparing a 5-year horizon with a 15-year horizon,

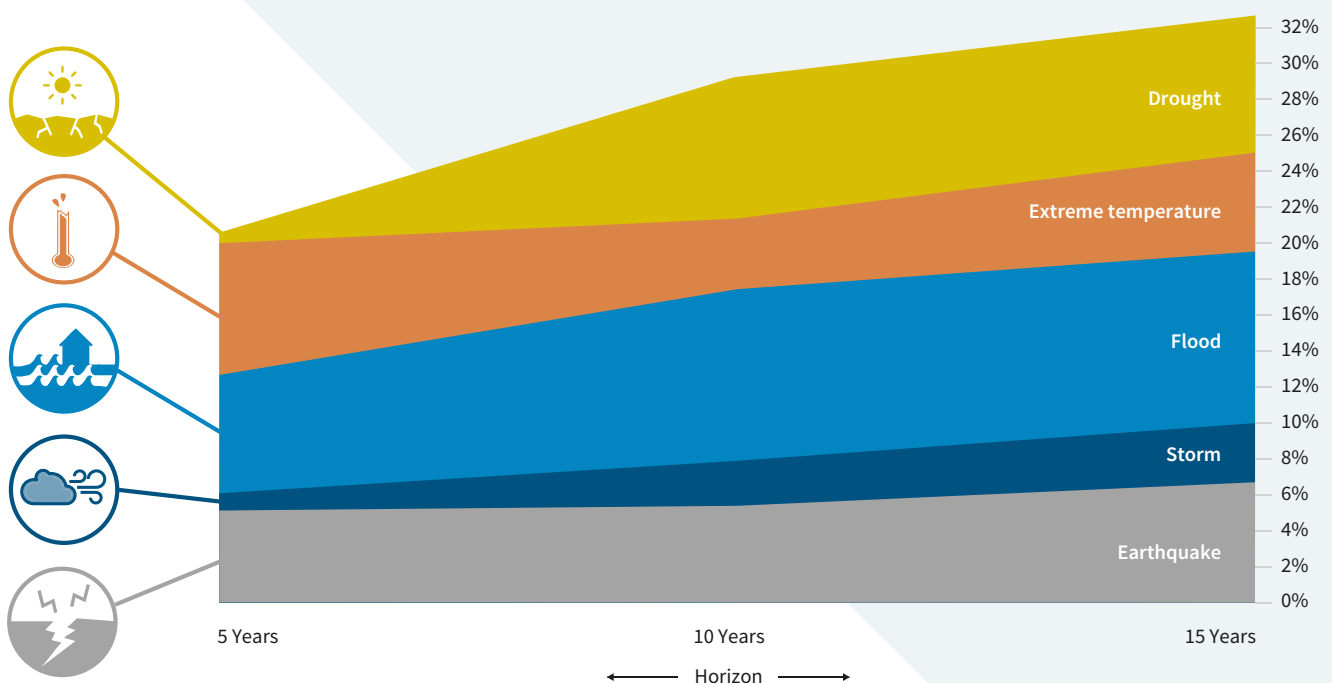
for earthquakes or extreme temperature the increase is much smaller.

One limitation of the proposed approach is that, while for some hazards (e.g. earthquake, storm and flood) long-term forecasts are limited within a certain range, for others (e.g. flood and extreme temperature) predictions suffer larger margins of error.

DISCLAIMER

As the intent of this note is to provide a very high-level summary, additional information can be found at the following link: [Forecasting reserving of NatCat with the CIR 2 model.](#) <

FIGURE 2



INSURANCE OF ELECTRIC VEHICLES

BY **GUILLAUME SERDECZNY** AND **SARAH CLARINARD**

In September 2021 Tesla Model 3 became the first electric vehicle to lead the best-selling cars chart in Europe. This could have been a seasonal effect of Tesla production timelines, but non-European Market share of battery electric vehicles went from 0,7% in 2017 to 7,5% of all new cars sold in Q2 2021 (source: ACEA).

This development of the electric vehicles (EVs) market raised a question in the P&C actuarial departments: is the risk of an EV similar to an equivalent Internal Combustion Engine Vehicle (ICEV)?

At first, it was difficult to arrive at a proper view of the intrinsic risk level of EV, since volumes were not big enough. Some people were afraid of fire risk related to the batteries, others underlined the dangerousness of a silent car for pedestrians crossing streets in a city. Car manufacturers tried to tackle these specific issues, and even if it is still worth to monitor such events, they appear to be quite rare.

But it is not always easy to compare EVs and ICEVs: how shall we define the equivalence in terms of vehicles when the framework (data collection) has been defined historically for ICEVs? For example, what is the power of a hybrid vehicle? The sum of combustion engine power and electric motor one? Or the maximum of the two values? Any other combination? It

of course depends on the structure of the hybrid vehicle (mild hybrid, full or strong hybrid...). But this shows that a simple and classic variable, often used in vehicles classification such as the power of the car, can become problematic when paradigm is changing.

The usage of EVs may also differ quite significantly from ICEVs: parked in a secured area, less kilometers driven, et cetera. All this has an influence on the risk level, and the information is not always well collected or monitored. In addition, in the 'EVs' category, very dissimilar vehicles can be found: there are only few similarities between a very high-powered, long-range Tesla and a small, urban vehicle like a Renault Zoé.

Therefore, pricing models are not always sharp enough to isolate the pure effect of energy in risk level. However, it seems now quite clear that during the 2010s, as compared with ICE vehicles, EVs had a higher insurance risk, driven by the cost of the vehicle, availability of spare parts, or global delays for repair works. >

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Is it still true today? There is no clear evidence, but it seems that the trend in pricing has recently switched: in some European Union countries, such as the United Kingdom or France, press releases are announcing that EVs insurance premiums are now cheaper than for other vehicles.

Why would insurers offer lower prices for EVs, if they don't know the associated risk level, and thus, the profitability they can expect?

There may be two main reasons for this: either this reflects opportunistic behavior on the part of economic agents, or it is a genuine commitment on their part to reducing greenhouse effects.

The first reason is quite simple: offering a discount is an efficient, and not that expensive, move to gain market share, especially in a growing segment. Adopting

an aggressive pricing strategy can also be a way for traditional insurers to secure a portfolio in a very competitive environment, where they are in addition facing new threats: Tesla started for example to offer auto insurance in the U.S., and in some states the pricing relies on an advanced telematics program, based on data extracted from the original equipment of the vehicles.

The second reason can be slightly more complex, since it's deeply linked to the following question: how green are EVs?

In fact, there are some concerns concerning EVs capacity to meet the environment goals of a sustainable development scenario. Where does the electricity to charge EVs come from? How are raw materials used for building the cars extracted? There are significant environmental and human rights concerns on this point: the mining industry is one of the most polluting, and child labor has been reported in cobalt extraction in the Democratic Republic of Congo.

But, all things considered, if the social movement, through government policies, institutional statements, and regulations imposed on car manufacturers, promotes the EV as one of the keys to the ecological transition, some P&C insurers may also be convinced of the advantages of such a move because they're truly sensitive to green activism.



This may be particularly the case for the companies which, beyond their simple corporate purpose, seek to leave a positive mark on society by taking up social and environmental challenges, while keeping their economic performance at the same time (see Benefit Corporations in the U.S, 'société à mission' in France).

For these insurers, promoting EVs achieves the objective of increasing market share and contributing to the common good via the transition to a greener future.

Above all, the role of actuaries will remain central as they will have to refine their vision of the risk for these vehicles and anticipate fluctuations as the market (supply and demand, but also usage) and the underlying technologies evolve. It will also be their responsibility to monitor these risks over time, as professionals in these central issues for insurers. <



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CORONAVIRUS AND INSURANCE IN FRANCE 2020-2021

BY **GUILLAUME LEROY** AND **FRÉDÉRIC PLANCHET**

The coronavirus epidemic from 2020-2021 had a significant impact on life and disability figures in France. The global mortality rate in 2020-2021 increased by 6 to 9 % as compared with recent years. The number of deaths stemming from coronavirus should be around 100.000 in 2020-2021 in France.

Yet, these figures are highly dependent upon the age brackets of the population, the impact is very limited on working age people as the following figures² show.

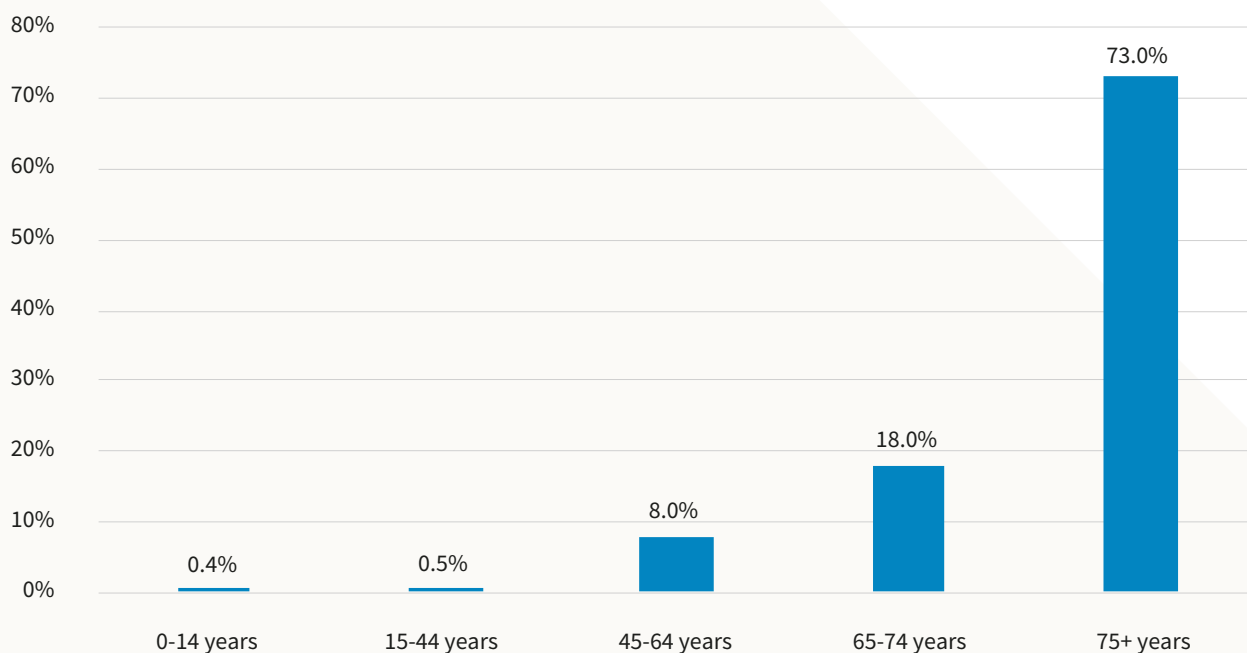
FIGURE 1: TOTAL MORTALITY IN FRANCE¹ IN 2020 AND 2021

	2018	2019	2020	2021
Size of the population	66 992 000	67 258 000	67 454 000	67 626 000
Number of death	609 600	613 200	668 900	657 000
Overall mortality rate	0.91%	0.91%	0.99%	0.97%
Mortality for the year 2020				
Excess mortality (number)	59 300	55 700		
Excess mortality (additional rate)	0.08%	0.08%		
Relative excess mortality	9.7%	9.1%		
Mortality for the year 2021				
Excess mortality (number)	47 400	43 800		
Excess mortality (additional rate)	0.06%	0.06%		
Relative excess mortality	7.8%	7.1%		

¹ <https://www.insee.fr/fr/statistiques/6024136>

² <https://fr.statista.com/statistiques/1104103/victimes-coronavirus-age-france/>

FIGURE 2: DISTRIBUTION OF DEATHS BY AGE



Almost three quarters of the covid deaths are over 75 years old, 60% of them are men and two thirds have comorbidities (overweight, diabetes, hypertension). As in other countries, the severity of the coronavirus issue was significantly dependant on the age, the other personal disability drivers and the level of information on the illness.

For the time being, it is difficult to assess whether this impact will be a short-term impact (people who were about to die due to other illnesses died earlier) or if it has a longer-term impact (a change in the mortality

trends). The latter is however more unlikely at that stage. Indeed, the mortality rate observed in 2021 is lower than the one observed in 2020 and the excess mortality rate for the year 2021 is concentrated in the first half-year. Thus, the annual variations in mortality over the last 30 years in France stand as follows: (figure 3)

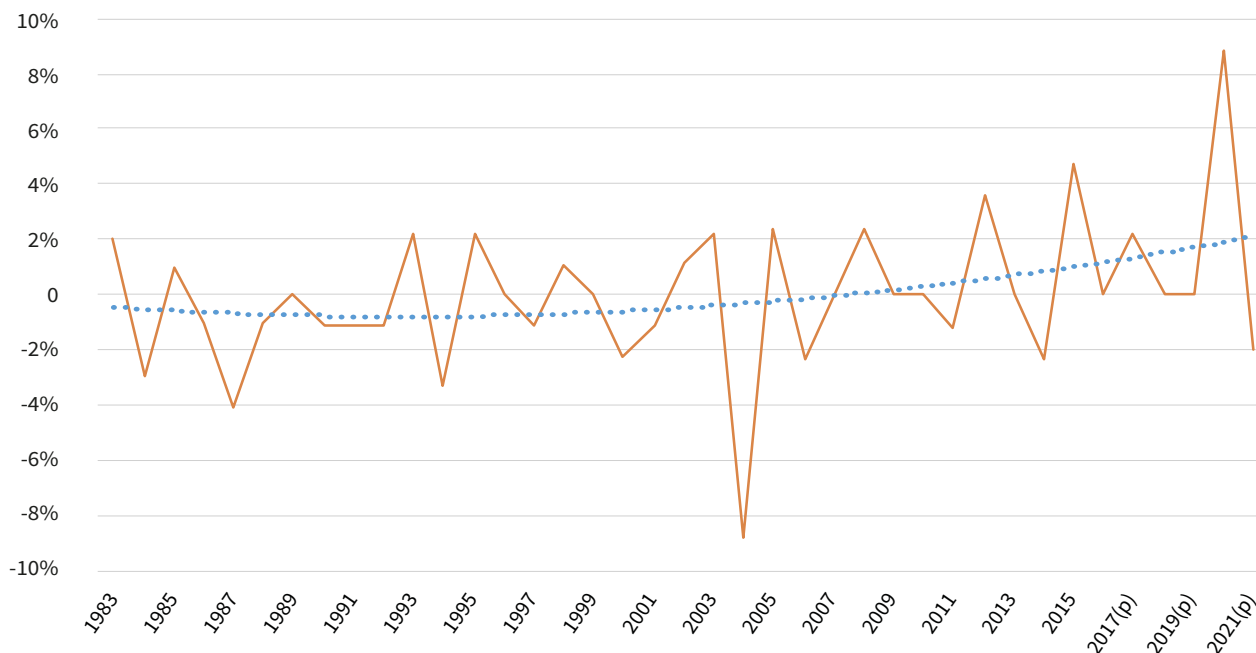
As for the disability rate, there was a significant impact of the epidemic on the short-term disability frequencies. At this stage, there was very little impact of the coronavirus epidemic on the duration of disability indemnities payments. >



FRÉDÉRIC PLANCHET

is an actuary at Prim'Act and works as an associate professor of Finance and Insurance at ISFA.

FIGURE 3: ANNUAL VARIATION IN THE AVERAGE DEATH RATE IN FRANCE (TREND IN BLUE)



THE IMPACT ON THE INSURANCE MARKETS

Due to the former observations, the impact of the coronavirus pandemic was very limited up to now. For life insurance policies involving working age people (collective death benefits for corporate employees, mortgage-backed death/disability covers for borrowers), the impact was close to nil.

For elder people, the impact was more significant for whole life policies. These lines of

business used to provide insurance companies with significant margins. These margins fell sharply in the last 2 years.

For disability covers, a slight impact on benefits was noticed in 2020-2021. Yet, other market trends had a more substantial impact in these fields: the change in the Social Security backed covers strongly influenced the situation and the rate online provided by insurers in 2020-2021. <



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THE ITALIAN EXPERIENCE OF COVID

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

BY **ISOA**

Since the beginning of the pandemic, monitoring information has been a key factor. Problems of diffusion, homogeneity, and reliability of some data have made study and containment of this event even more complicated.

The Protezione Civile [Italian Department of Civil Protection] and the Istituto Superiore di Sanità (ISS) [Italian National Institute of Health] worked to provide an increasingly wide range of detailed data as the pandemic progressed. However, there continued to be insufficient information to facilitate development of a multi-status actuarial model; one which could offer a full overview tracking status changes across population groups (healthy, hospitalised, intensive care, recovered, deceased).

Consideration of two years of pandemic evolution results in some clear reflections for us:

- From the beginning, this has been a global phenomenon – Italy cannot consider itself in isolation, nor Europe on its own, but must look far beyond. Countries have failed to take a global view, and in many cases have not provided homogeneous, timely and correct data. Various international organisations have also demonstrated that they lack the authority to solve this problem; for example, bulletins with international data released by the WHO have sometimes been inconsistent between countries.
- Before production of vaccines began, the only effective course to prevent the spread of the virus was by introducing restrictive measures, which many countries did. Italy's example is striking here, as its introduction of a lockdown early in the first phase of the pandemic yielded two important results: by the end of July 2020 the virus had not reached the south of Italy and case numbers were moving asymptotically towards 0. >

The second phase of the pandemic brought some reopening in summer, lower compliance and, by autumn, less restrictive measures despite worse numbers than in March/April. This scenario resulted in steep growth in Italian case numbers with more dramatic consequences, similar to the situation faced by those countries which had not reacted promptly during the first wave (the key example here is Brazil). We should not fall into the trap of hindsight bias here, where we say that restrictive measures should have been introduced as they were in the spring because in reality the choices were not simple, taking into account the intersecting factors of health, economy and various dynamic social factors. Weighing up all these interests, governments have sometimes tried to sacrifice one for the good of others, only to ultimately find themselves defeated – not so much by the lethality of the virus, but by the ease at which it spreads in our highly interconnected modern society.

- Something that started out as a hunch for us and was then confirmed in the first and subsequent waves is that, statistically speaking, the incidence of coronavirus explodes rapidly and then, once controlled, gradually decreases. Growth is exponential and moves at a higher speed than decrease, which follows a linear pattern with subsequent effects on deaths and positive totals.
- Science started making its best contributions within the first year of the virus spreading. Research has developed and then produced several different vaccines which have been distributed to the population since December 2020. We cannot fail to remember that, like statistics, vaccines require a defined time frame to be meaningful – short cuts are no good here. As such, having not had a previous long experimental phase, we had to wait for the first empirical evidence before we could make any expression about vaccine effectiveness. From analysing the official data available about population vaccination and long-term efficacy, it can be said that:

- **the vaccine is effective**, especially in reducing severe risks (intensive care and deaths) and slightly less effective at reducing milder risks (contracting the infection). This is evident from analysing the ISS data categorised into vaccinated and unvaccinated patients. When analysing only the absolute numbers, the ‘*paradoxical effect*’ is evident: as the population reaches high levels of vaccine coverage, the absolute number of infections, hospitalisations and deaths between vaccinated and unvaccinated groups may be similar, because of the progressive shrinking of the unvaccinated population exposed to risk. This phenomenon makes it necessary to reprocess the absolute numbers in such a way that we can obtain representative indicators, such as the relative incidence rates in a population of 100,000 individuals. This approach should better represent the probability of ‘*claims*’ or individual effects (contagion, hospitalisation, intensive care, death) in the different populations exposed to risk (unvaccinated, vaccinated with a single dose, fully vaccinated).
- **the effectiveness of the vaccine is not lasting and tends to decrease over time**. Looking at the data released by the ISS, we note that, among the vaccinated, the patients most vulnerable to the virus are those whose second vaccine dose was administered more than 5 months previously.
- **booster doses** seem to be the most effective solution for continued control of virus spread.

With these few considerations in mind, it is valuable to try to understand what impact COVID-19 has had on the mortality, sickness, morbidity, and disability of the population, and what implications this has for pension systems and the pricing of various insurance products.

Sufficient data has not yet been produced for an in-depth study of morbidity and disability. The most recent studies of Italian population mortality with reference to the impact of COVID-19 during 2020, with distinctions by sex, age groups and territorial areas, were completed by ANIA (the National Association for Insurance Companies) in June 2021. ➤

In analysis of daily mortality rates in the years from 2015 to 2020, it is notable that, from low mortality numbers in the first few weeks of 2020 there was a steep infection-related rise from the end of February until March 25, when mortality rates hit a peak and numbers were more than 75% higher than average figures for the previous five years. April also recorded mortality rates that were significantly higher than in previous years, albeit drastically lower than March thanks to containment measures. The effect of the lockdown led to a subsequent decrease in mortality which remained substantially in line with numbers from previous years until the end of summer. From early autumn onward, mortality rates started to increase again and remained higher than previous years' figures until the end of 2020.

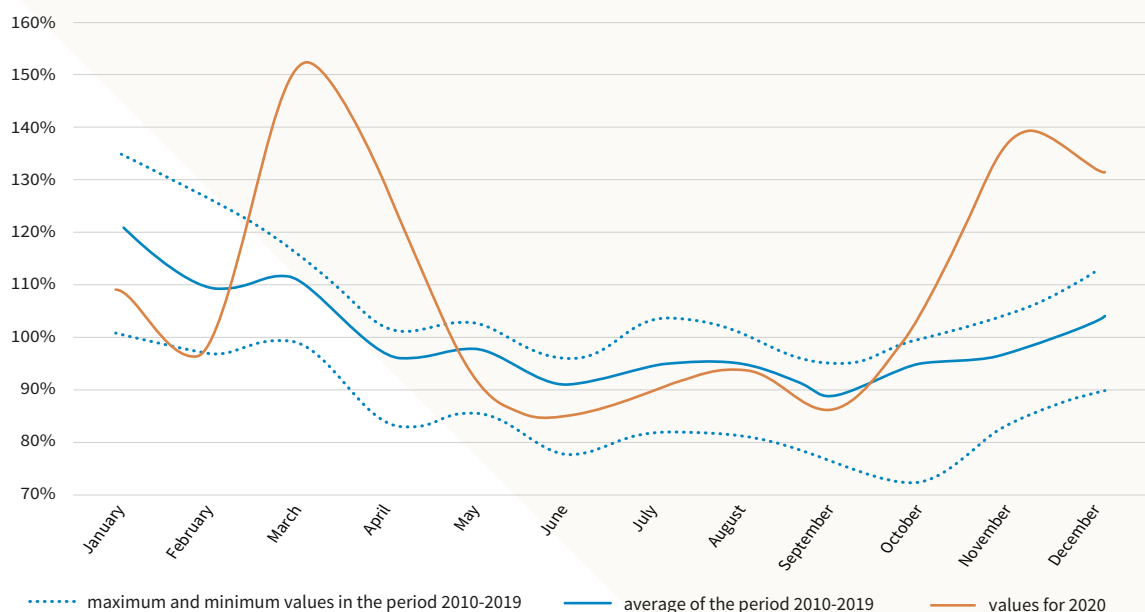
Overall, applying the 2019 and 2020 daily mortality rates to the 2020 population exposed to risk, it can be estimated that 2020 was characterised by 'excess'

mortality of about 108,200 deaths (+15.1%) more than 'ordinary' mortality, an increase due almost exclusively to COVID-19. This was only partially balanced by lower mortality achieved through containment measures, especially with reference to accidental causes.

Distinguishing the data by sex, we note the higher incidence of male mortality: in all the regions most affected by the virus the mortality rate for men has been higher than the average.

To better understand the seasonality of the mortality trend, monthly standardized rates were used to calculate average values for the decade 2010-2019, and these values were compared to the average of the same rates for all the months of the period 2010-2019 (*the intermediate continuous dark line in figure 1*).

FIGURE 1: CHANGES IN MONTHLY MORTALITY RATES COMPARED TO THE AVERAGE FOR THE PERIOD 2010-2019 AND 2020 (%)



Source: ANIA 'TRENDS - Tendenze demografiche'

The dotted lines represent the maximum and minimum values recorded in the months of 2010-2019 compared to the average; the red line represents the monthly values for the year 2020, always compared to the average of the period 2010-2019.

Mortality in the period 2010-2019 reaches its maximum values in January and minimum values from June to September. In 2020, the values observed at the peak of the pandemic were at levels significantly higher than the average levels of the

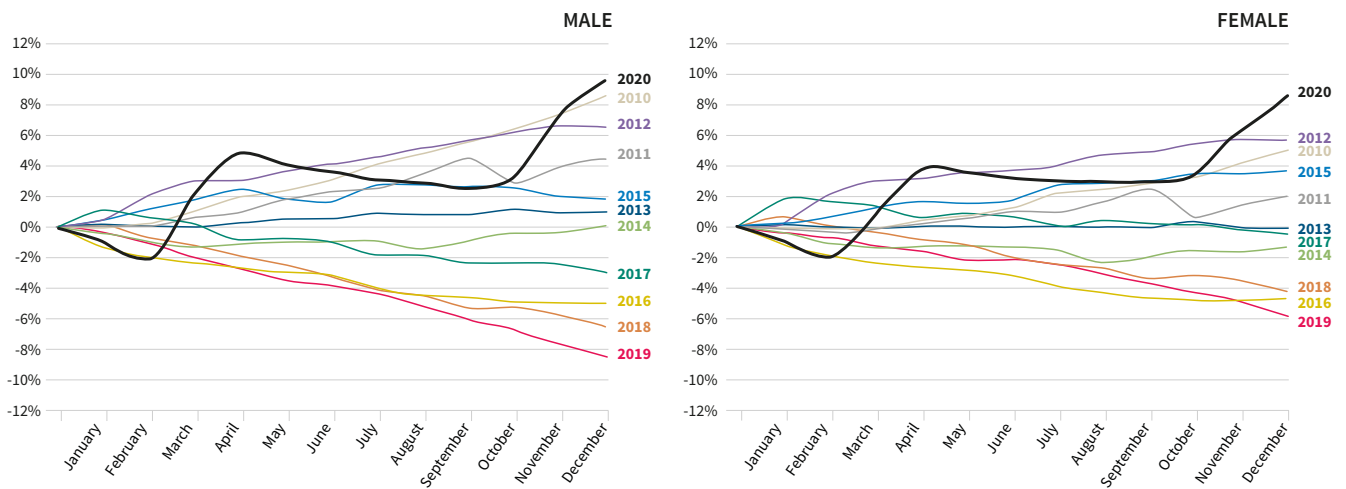
2010-2019 period: greater than 50% during the first wave and equal to almost 40% more during the second wave.



The analyses were replicated separately by gender and pre-established age groups, and have been reported in

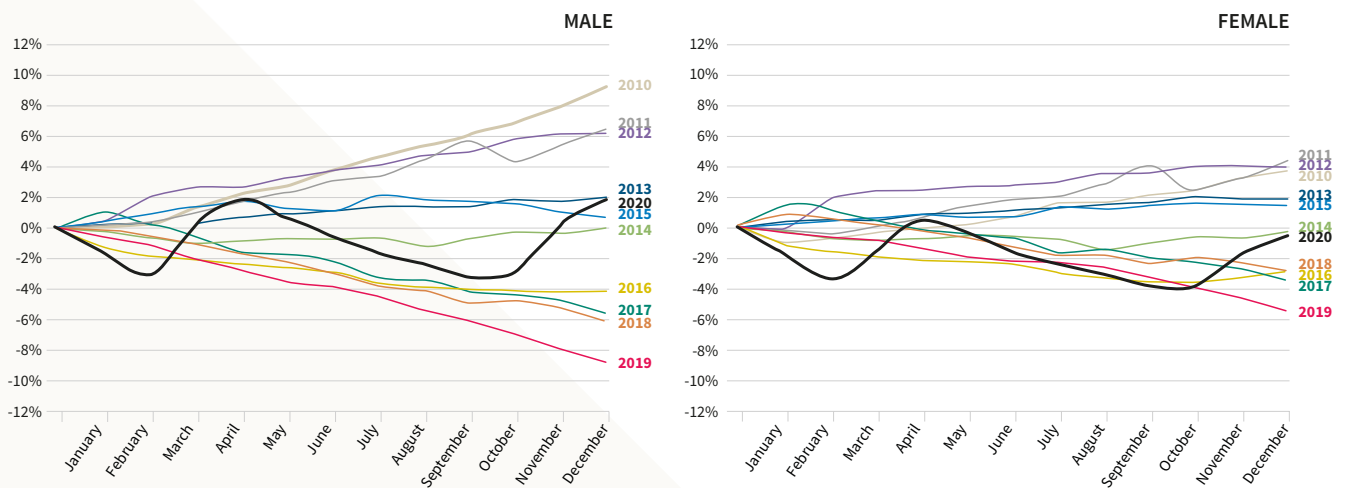
the following figures. The specific age ranges evaluated were: 20-100, 0-64, 65-84 and 85+ years.

FIGURE 2: VARIATION IN CUMULATIVE MONTHLY MORTALITY RATES IN THE YEAR COMPARED TO THE 2010-2019 AVERAGE - AGE 20-100, (%)



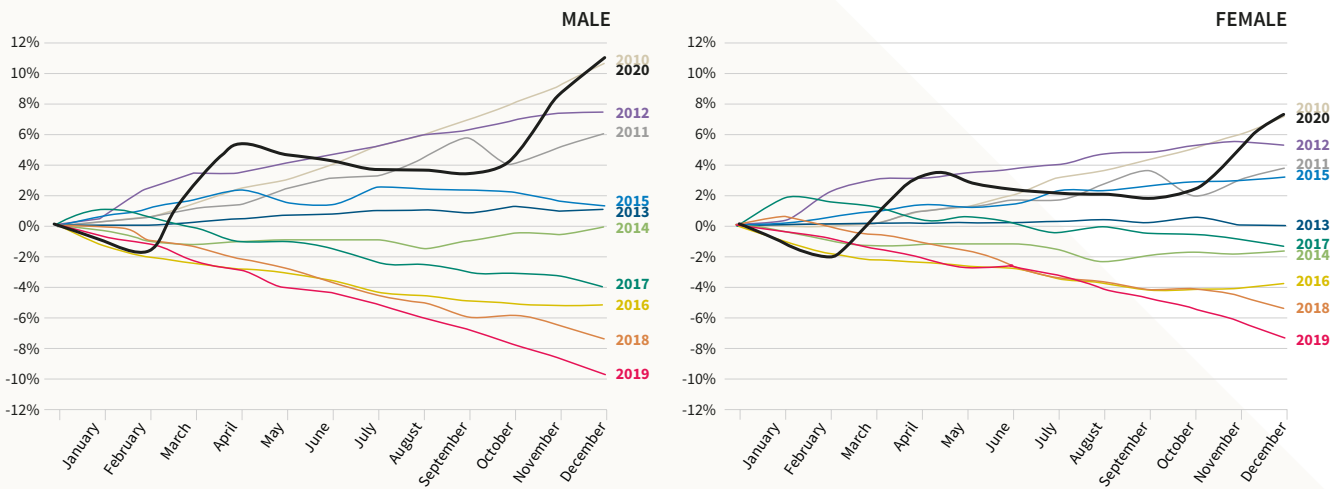
Source: ANIA 'TRENDS - Tendenze demografiche'

FIGURE 3: VARIATION IN CUMULATIVE MONTHLY MORTALITY RATES IN THE YEAR COMPARED TO THE 2010-2019 AVERAGE - AGE 0-64 (%)



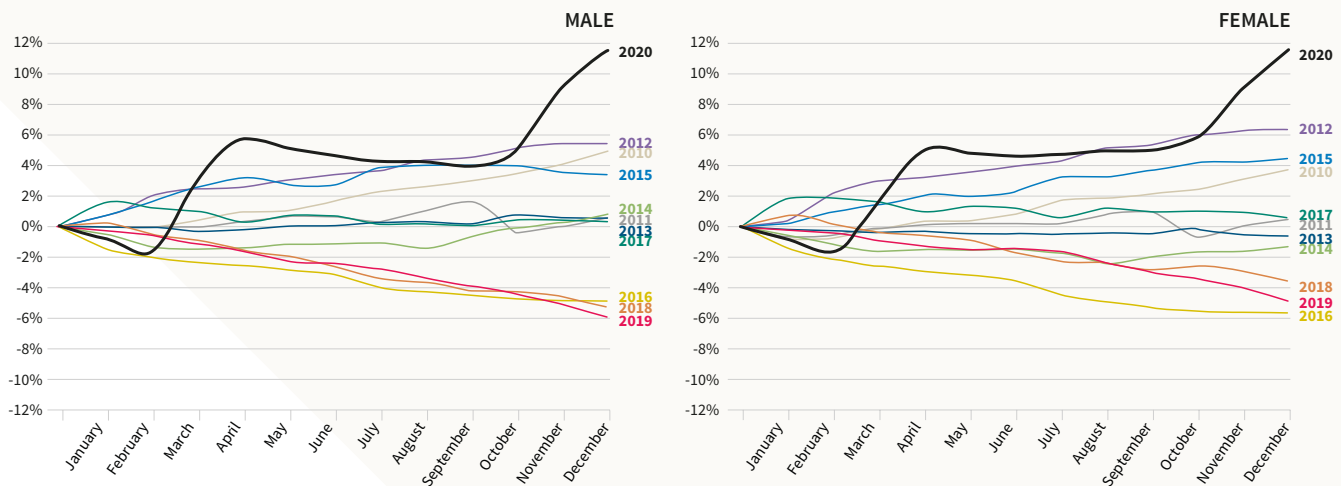
Source: ANIA 'TRENDS - Tendenze demografiche'

FIGURE 4: VARIATION IN CUMULATIVE MONTHLY MORTALITY RATES IN THE YEAR COMPARED TO THE 2010-2019 AVERAGE - AGE 65-84 (%)



Source: ANIA 'TRENDS - Tendenze demografiche'

FIGURE 5: VARIATION IN CUMULATIVE MONTHLY MORTALITY RATES IN THE YEAR COMPARED TO THE 2010-2019 AVERAGE - > 85+ (%)



Source: ANIA 'TRENDS - Tendenze demografiche'

From analysis of the figures it is observed that:

- with regard to the 20-100 age group, for both males and females above-average cumulative mortality rates are recorded in the first part of the period as well as in 2020, while the lower rates are recorded in 2016, 2018 and 2019;
- the 0-64 age group reflects a lower impact of contagion for the year 2020: the years with the highest mortality rates are 2010 and 2012, the one with the lowest mortality compared to the average is 2019, while the mortality of 2020 is substantially in line with the average mortality for the 2010-2019 period;
- for the 65-84 age group, mortality in 2020 and 2010 was at its highest compared to the average, while 2019 remains the year with the lowest mortality;
- the 85+ age group, on the other hand, emphasises the impact of COVID-19; the 2020 rate is the highest of all the years observed and brings the increase in cumulative mortality compared to the 2010-2019 average to almost 12% for both sexes.

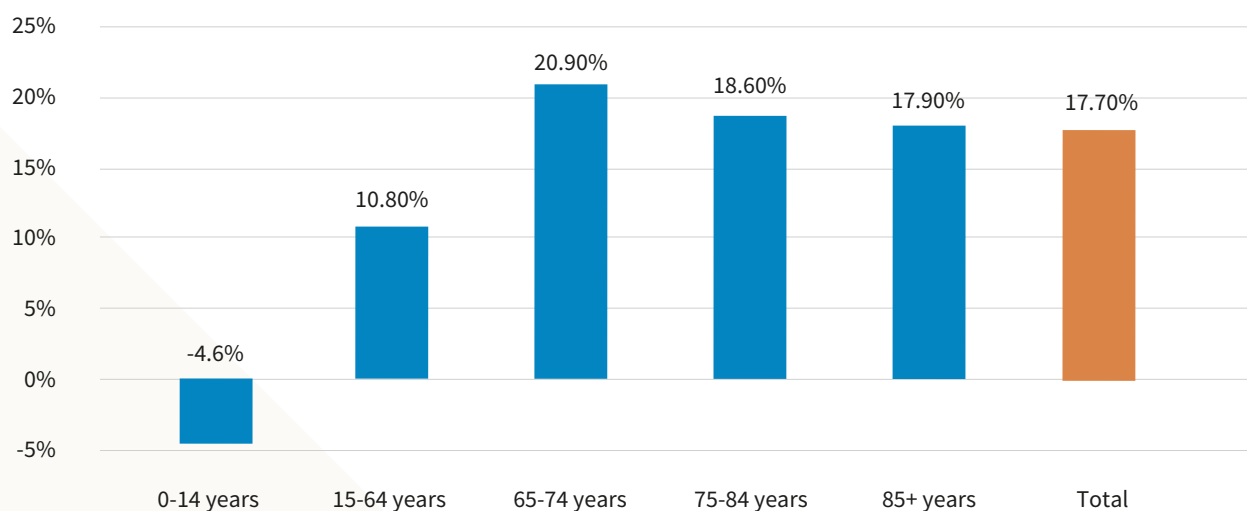


The ANIA report also makes a comparison of the impact of COVID-19 on mortality for different age groups with figures recorded in other countries. For this comparison, reference was made to data from the Human Mortality Database (HMD), which is slightly different from the ISTAT surveys, but substantially indicates a similar increase. The following table is the extrapolation of the Italian results from this analysis between countries. In the 0-14 age group a decrease in deaths was observed, and this cohort was in fact the least affected by COVID-19 in the first phase of the pandemic. In the 15-64 group on the other hand, we see an increase in

the number of deaths, while the greatest increase is observed in the 75-84 and 85+ groups, as expected.

Although we are still experiencing the effects of this pandemic, we should have passed the most acute phase now, and to date there has not been any particularly strong impact on the pension system, while regulatory constraints mean there has been zero impact on the requirements and social pension coefficients. In fact, in accordance with Italian legislation, increasing variations in requirements and coefficients are envisaged only in the event of falling mortality rates and not in the opposite scenario.

FIGURE 6: CHANGE IN THE NUMBER OF DEATHS IN ITALY BY AGE GROUP 2019-2020 (%), FROM HUMAN MORTALITY DATABASE



ISOA is an Italian association established to represent and follow all international activities of Italian fully qualified actuaries registered on the official public list (Albo).

IMPACT OF THE PANDEMIC ON MORTALITY AND MORBIDITY IN GERMANY

BY **BY DIRK STÖTZEL FOR DAV**
(GERMAN ASSOCIATION OF ACTUARIES)

Since the pandemic started, the Robert Koch Institute has counted 13.762.895¹ certified infections with the SARS-CoV-2 virus and 121.603² related deaths. According to a press release of the Federal Statistical Office of Germany³, the coronavirus pandemic has led to increased mortality in the German population. Christoph Unger, vice president of the Federal Statistical Office, said in a press conference on 9 December 2021 in Wiesbaden, *'Between March 2020 and mid-November 2021 more people in Germany died than we would have expected by taking into account the demographic development. The increase of deaths cannot be explained just by ageing of the population. It has been significantly influenced by the pandemic.'* Currently, however, it is still too soon for statements regarding the life insurance portfolios for the year 2021.

Mortality in the insured portfolios will not significantly increase as a consequence of the pandemic

Because of the various government actions to control the pandemic, together with the growing immunity in the population by vaccination and considering the high average age of corona-related deaths, the German Association of Actuaries (DAV) thinks that, in the medium term, mortality in the insured portfolios will not significantly increase as a consequence of the pandemic. Social distancing and hygiene rules have reduced other diseases, e.g. seasonal waves of influenza. It is not yet clear to what extent the new behavioural patterns in the population or medical

improvements triggered by the pandemic will exert a positive future impact on mortality. On the other hand, new virus variations, deteriorating protection after vaccination, corona-related long-term damage to health and the resumption of extensive travel could increase the risk.

In occupational disability insurance, no higher level of insurance claims caused by the coronavirus can be seen in Germany so far. However, it is too soon for statements on whether and to what extent long-term consequences of the corona disease or general health repercussions of the lockdowns influence morbidity levels. Possible effects will show only in the upcoming years. In addition, the economic development could have a negative impact on recoveries.

Due to corona effects, the increase in life expectancy has paused, at least temporarily. However, there are at the present time no signs for a permanent decline of life expectancy compared to the pre-pandemic level. All in all, we currently think that mortality, after the pandemic, will again come close to the pre-pandemic expectations. If Long COVID and the lockdowns should have an impact on morbidity, then this could, in our opinion, be mitigated by the collective business model of the life insurance industry, together with safety margins in pricing and reserving stipulated by law and smoothing mechanisms (e.g. reinsurance). <

¹ Status 22.02.2022

² Status 22.02.2022

³ no. 563 from 9 Dec 2021, see also press release no. 014 from 11 Jan 2022

ACTUARIES AND THE MEDIA IN THE PANDEMIC

BY **JOHN ROBERTS** AND **STUART MCDONALD**

Over the last two years the pandemic has resulted in epidemiologists, immunologists and modellers being thrust into the limelight to an extent that they might never have imagined. In the UK, actuaries too responded to the need for rapid, reliable and trustworthy analysis by harnessing social media in a way that previously had not been seen by the profession.

The COVID-19 Actuaries Response Group (ARG) was founded at the outset of the pandemic as part of the UK profession's response. Encouraged by Tan Suee Chieh, then President-elect of the Institute and Faculty of Actuaries (IFoA), the ARG's objective was to provide analyses and insight of the developing situation. In such a fast-moving crisis, agility has been key to delivering timely messaging. The speed of response needed has challenged traditional ways of actuarial working, with days (even hours) replacing the weeks and months that actuarial research (admittedly usually more complex) typically involves.

Whilst the ARG has a website (covidactuaries.org) where original material is published, we quickly found Twitter to be the most effective communication channel. The ARG account ([@COVID19Actuary](https://twitter.com/COVID19Actuary)) and personal accounts of some members signpost useful information, provide insight, and respond to questions raised. Although personal accounts are used, members are representatives of the profession, and are careful to adhere to the IFoA 'Actuaries Code' – though interaction with people who deliberately set out to mislead sometimes tests our ethos to be polite and respectful with those we engage with!

There is a lot of misinformation regarding the pandemic on social media. An important aspect of the ARG's work has been addressing misinformation and explaining why it is wrong or misleading. We are regarded as a trusted and objective source of information, in line with the profession's reputation.

Interpretation of data published elsewhere has also been a key aspect of the work, examples being the UK's statistical body, the [Office for National Statistics](https://www.ons.gov.uk) (ONS), the [Intensive Care National Audit and Research Centre](https://www.intensivecare.nhs.uk) (ICNARC) and the >

JOHN ROBERTS is an actuary with nearly 40 years' experience in the profession, spent working in the UK life industry, predominately at Canada Life and Zurich. With many years' experience of both the group risk market, and life office pricing, John has most recently focused on establishing longevity swap contracts in respect of pension scheme liabilities.



Continuous Mortality Investigation (CMI).

The CMI is another great example of how the UK profession responded to the pandemic. Here the ARG has sought to bring the CMI's age-standardised mortality analysis to a much larger audience than normal, helping explain why this is a better basis for calculating excess mortality than simpler death counts. Developing that theme, Stuart has collaborated with the CMI to support Sky News who produced helpful analyses putting the mortality shock of the last two years into historical context for the public.

'Just 30 minutes prior to the broadcast we were asked by a BBC reporter to estimate the impact the announcement would have.'

One of the key benefits of Twitter has been the ability to engage with traditional media and politicians. Many media networks have journalists closely following our work, and behind the scenes Group members are often asked for advice. One recent example was the UK Prime Minister's announcement at 8pm on a Sunday night of an acceleration of the booster campaign. Just 30 minutes prior to the broadcast

we were asked by a BBC reporter to estimate the impact the announcement would have. We were able to respond, and the reporter used our figures on national TV immediately after the Prime Minister spoke.

Media appearances have become common, some of which have influenced government policy. John has been repeatedly interviewed by the BBC's flagship radio programme 'Today', which is closely listened to by politicians. And Stuart has been dubbed 'favourite actuary' of 'More or Less', a weekly statistics programme on which he has regularly appeared. Three members of the team have conducted live TV interviews (for BBC News and Newzroom Afrika), a nerve-wracking experience, hoping the home Wi-Fi doesn't lag at an inopportune moment, and the family pet doesn't make a bid for stardom.

Political influence has extended beyond media interviews though. At the start of the vaccine rollout our analysis confirming that the priority ordering was optimal in terms of reducing deaths was widely quoted by the UK Government, including the Prime Minister. IFoA volunteers, including members of the ARG, have also supported the UK Government's scientific advisory group (SAGE), most notably in modelling the impact of an overwhelmed health system on mortality rates. >

One of our regular outputs is the **'Friday Report'**, a bi-weekly compendium of news, data, and links to research papers. This is promoted on both **Twitter** and **LinkedIn**, the other social media network used by the ARG.

Whilst the ARG has a UK focus, we have greatly benefited from a member based in South Africa, particularly helpful at the start of the Omicron wave. We have also commissioned international articles where they form a useful contrast to the UK position. Nevertheless, we would benefit from a wider international perspective, and would welcome any approaches in that regard.

'the profession should consider whether some of the innovative ways that the Group has operated can be useful elsewhere'

One side effect of the ARG's work has been to raise the profile of the actuarial profession in the UK, both with the public and with politicians, including those in government. As we move beyond the acute phase of the crisis, the profession should consider whether some of the innovative ways that the Group has operated can be useful elsewhere. This might include the agility with which the ARG operates, or the ways it has engaged with the public.

Whilst the pandemic has offered a unique opportunity to showcase the skillsets of actuaries, other topics, such as future pension and social care provision, and climate change, will be of great, if not such urgent, relevance to the population. Actuaries are ideally placed to inform these debates in the future. <



STUART MCDONALD is Head of Demographic Assumptions and Methodology for Lloyds Banking Group. He plays an active role within the actuarial profession, currently serving on the Executive Committee of the Continuous Mortality Investigation. He founded and co-chairs the COVID-19 Actuaries Response Group. Stuart was awarded an MBE for services to Public Health in the 2022 New Year Honours

LOOKING AT GOOD GOVERNANCE

BY JENNIFER BAKER

This issue we caught up with MEP Fabio Massimo Castaldo, Vice-President European Parliament, to talk about governance, the review of Solvency II and the role of actuaries.

Since the IORP II Directive, actuaries are more involved in pension funds management. Do you think that the governance role of the actuary is increasing in this field?

‘The actuarial function, as designed under IORP II, has strengthened the contribution of the actuary to the technical and economic stability of pension funds, and, as a result, the direct and indirect role in the governance of the sector. In fact, IORP II requires an effective actuarial function to, among others, oversee the calculation of technical provisions and assess the appropriateness of the methodologies and underlying models used.

In 2016, when the European Parliament negotiated and approved the directive, we considered that an increased governance role for the actuary

stood for quality assurance, as embedding appropriate risk-based practises is essential in order to adequately manage the risk exposure of the pension business. I believe the decision paid off, as the involvement of a qualified actuary, in addition to the role of the risk manager, proved fundamental to guarantee the good health and goal achievement of the fund.’

Actuaries have played a significant role in the Solvency II process in life and non-life insurance for many years. Do you observe a real increase in the actuary’s contribution to governance? Do you also observe a general improvement in insurance companies’ governance? What about the impact of the Solvency II review?

>



An appropriate integration of climate issues in the legislation is key too.

'In the same way, with the introduction of Solvency II, the system of governance of insurance and reinsurance undertakings has benefited from the actuary's multi-sector experience and expertise. The risk manager and the actuarial functions have helped improve the operational efficiency and quality of the internal processes in the insurance business, especially with regard to solvency quantification, which sets a high standard in terms of technical expertise.

In the Economic Affairs Committee of the European Parliament, we are now beginning to work on the much-anticipated review of Solvency II. The priority is to achieve the right balance in the application of the overall framework, removing excessive burdens without harming financial stability and policyholder protection. An appropriate integration of climate issues in the legislation, which must also incorporate a risk-

adequate treatment of long-term investments, is key too.

The feedback of the Actuarial Association of Europe (AAE), as the association that represents the sector in the EU and therefore has the necessary industry knowledge, will be very important at this stage, in order to better understand the limitations around the application of the regulatory framework and develop potential ideas for improvement.' >

FABIO MASSIMO CASTALDO





I believe the actuary has a role to play to assist regulators in the design of instruments.

In 2023, IFRS17 will begin to be applied in the insurance field; do you consider this positive? Actuaries and accounting will be able to work together adding value to the consolidated financial statements?

‘The introduction of the accounting standard IFRS 17 will mark a radical change in the insurance business and I understand there are differing views on the issue, also in view of the significant investment required in actuary, risk and accounting. IFRS 17 is driving increased collaboration between the accounting and actuarial worlds as regards financial closing, because existing procedures, such as preparing the financial statements, will no longer be within the exclusive purview of accountants. Therefore, a challenge in the design of IFRS 17 operating models will be to ensure the two departments work together effectively. In my opinion, creating a cross-functional team comprising people with different areas of expertise is a solution worth exploring and may ultimately deliver benefits.’

From a general point of view what is the perception of the actuarial contribution to risk evaluation in different fields, especially systemic risks?

‘The perception is definitely positive, in the sense that it is increasingly evident that actuaries can make an important contribution to the quantification of risks, including those of a systemic nature, also to help the public sector make more informed decisions. The actuarial profession has long been modelling complex systems involving changes in conditions and policyholder behaviour. As technology continues to open up new avenues and global markets display more interconnectedness, there is a greater risk of heavy inter-dependency. Here, I believe the actuary has a role to play to assist regulators in the design of instruments that can be employed to monitor systemic risk scenarios also outside of financial services. It is time to fully recognise this matter in the European Union’s legislation.’

How do you see the role of the actuary in future?

‘The expertise of the actuarial profession has never been more needed. According to the US Bureau of Labor Statistics, the demand for actuaries is projected to increase 24% from 2020 to 2030 — much faster than the average profession. The actuary is increasingly involved in quantitative risk management, and not only in the traditional insurance or finance industries, but in other fields, such as the welfare system, or to analyse the longer-term implications of climate change and developments in human longevity. Actuaries can play a role in creating a positive future by helping the public and private sector understand complex challenges around risk and uncertainty. What is important now is to invest in training, as skill upgrades will be required to keep the actuaries current and help elevate even more the reputation of and the demand for the profession. I welcome the AAE’s strong commitment to professional development in Europe and look reassuringly to the future of the sector.’



SUSTAINABILITY AND CLIMATE CHANGE: MAIN POSITIONS OF THE AAE

BY **FRANK SCHILLER**

In recent decades we have seen increased insurance losses due to natural catastrophes. A wide range of commentators, including leading reinsurers and modelling firms, report clear upward trends in risks that can be directly connected to climate change. These trends have been observed, modelled and explained by scientists. Leading experts in this field have been honoured by Nobel prizes for their research. The AAE is deeply concerned about the effects of the climate crisis endangering mankind and the unprecedented risks it introduces for all economic sectors and in particular for insurance, reinsurance and rest of the financial sector

The current Assessment Report 6 of the IPCC is quite clear: *'Emissions of greenhouse gases from human activities are responsible for approximately 1.1°C of warming since 1850-1900' and 'many of the changes observed in the climate are unprecedented in thousands [...] of years'*. Warming beyond 1.5°C will increase physical consequences significantly. At approximately 2°C irreversible tipping points in the climate system could be reached.

Consequently, almost all countries committed in the 2015 Paris Agreement to a 1.5°C warming target and this target has been confirmed at the COP26 summit

in Glasgow 2021. Measures to achieve this target will now be made more transparent and more closely monitored by most countries. However, this target is far from easy to reach. All current national pledges taken together do not suffice to limit global warming below 3°C. This climate action gap is very material and relevant. Closing it will require an unprecedented level of global action in the 2020s as well as later. It is not only **physical risks** that have to be managed adequately¹ i.e. risks that arise from the physical effects of climate change including risks like:

- Particular weather-related events, storms, floods, fires >

¹ For a more detailed overview and discussion refer to EIOPA's *'Opinion on the supervision of the use of climate change risk scenarios in ORSA'*, EIOPA-BoS-21-127, 19 April 2021.

or heatwaves that may damage production facilities and disrupt value chains, and

- Longer-term changes in the climate, such as temperature changes, rising sea levels, reduced water availability, biodiversity loss and changes in land and soil productivity.

In addition we as actuaries should be identifying and managing **transition risks** that are related to the climate change, i.e. risks that result from the transition to a low-carbon and climate resilient economy.

They include:

- Policy risks, for example as a result of energy efficiency requirements, carbon pricing mechanisms which increase the price of fossil fuels, or policies to encourage sustainable land use.
- Legal risks, for example the risk of litigation for failing to avoid or minimise adverse impacts on the climate, or failing to adapt to climate change.
- Technology risks, for example if a technology with a less damaging impact on the climate replaces a technology that is more damaging to the climate.
- Market sentiment risks, for example if the choices of consumers and business customers shift towards products and services that are less damaging to the climate.
- Reputational risks, for example the difficulty of attracting and retaining customers, employees, business partners and investors if a company has a reputation for damaging the climate.

These physical and transition risks originating from ongoing climate change and from the potential climate change action gap together form what is called the **climate crisis**.

The European Commission sees insurance and pensions as playing a prominent role in supporting Europe achieve the required climate targets and in enabling society and business to manage the transition². Investment processes as well as the provision of insurance and reinsurance can play a key role in the transition towards a sustainable economy. Sustainability principles already form a pivotal ingredient in how insurance and pensions protect against severe events for both individuals and organisations and in how they ensure financial security in old age. Hence actuaries can play a key role in analysing Environmental, Social and Governance (ESG) risks and in supporting adequate risk assessment for the underwriting of and the capital allocation for such risks. We need to ensure that the pensions and insurance industry stay true to these sustainability principles by addressing the following questions:

1. How can we effectively manage the risks posed to insurance and pension systems from short and long-term policy impacts of climate change and other environmental or social trends? – *social and financial sustainability*
2. How can insurance and pensions contribute to the needed transition through investment policy and transition project insurance as well as via pay-outs linked to >

² Communication from the Commission to the European parliament and the Council on the review of the EU prudential framework for insurers and reinsurers in the context of the EU's post pandemic recovery, COM(2021) 580 final, 22.9.2021, page 2

climate related physical risks which are insurable? – *climate sustainability*

3. For climate risks borne by society which are not currently insurable (or may become uninsurable as market conditions evolve), how can public policy work with insurance and pension systems to ensure that society is covered in these areas? – *climate protection gap*

SOCIAL AND FINANCIAL SUSTAINABILITY

The European Commission published its proposals for an amendment of the Solvency II Directive on 22 September 2021. We highlight a basic principle of the Solvency II framework we think is still key: **'same risk – same capital'**. If so-called 'green supporting' or 'brown penalising' factors are introduced into Solvency II capital requirements to provide more guidance on the assessment of climate risks for investments, they should be scientifically based and reflect the quality of the investments and their inherent risks. Obviously, we must acknowledge that the integration of an emerging risk like climate change cannot rely solely on historical statistics but needs to factor in forward-looking considerations. If such factors are also introduced on the underwriting side, e.g. for insurance products which encourage the mitigation of sustainability risks, they should be similarly justified on scientific

grounds based on the nature of the risks inherent in the covered exposures.

We support already proposed initiatives that contribute to an appropriate **integration of climate risk in the Solvency II framework**, e.g., climate scenarios in the ORSA and regular reviews of

the Nat Cat model of the standard formula. In addition, we also see great benefits in including **climate change scenarios in the stress testing exercises** for the insurance and pensions industry. Actuaries with their profound expertise in assessing risks can provide a valuable contribution to the extension and updating of existing frameworks and will >



DR. FRANK SCHILLER
has been working at Munich Re as Chief Actuary in life and health reinsurance since 2015 and is responsible for the markets in Europe, Latin America (till 2020) and Middle East.

be able to support well informed decision-making by the insurance and pension industry based on qualitative and quantitative analysis.

For savings products in pensions and insurance, it is important for policyholders to be well informed about the investment strategy and the sectors in which their money will be invested. Here, the insurance and pension industry can provide clarity for the public on how to invest in the future for society using sustainable products. Hence, we support a transparent **classification of savings, pensions and investment products by ESG criteria** and a clear and **informative sales process** to support policyholders' decisions.

Insurance (life & health) and pensions also directly contribute to ensuring **financial security in old age** and **contribute to protecting against loss of ability to work or financing medical treatment and care**. Ideally, existing solutions should be extended to broaden their attractiveness and their effectiveness as solutions against old age poverty, especially for 'gig economy' workers with minimal employment benefits and socially disadvantaged persons. This would further the impact these products might have on social sustainability.

All in all, actuaries have a key role in providing transparency and establishing a sound framework on how and what gets measured in a business context to drive the behaviour of firms. Where current accounting and valuation standards inappropriately externalise (i.e., exclude for the firms themselves) costs of non-green activities, we should ensure that accounting standards are modified to provide stronger incentives to close the climate action gap.

CLIMATE SUSTAINABILITY

As long-term investors, pension funds and insurers can also play a relevant role in financing the desired societal transition to a more sustainable future with a reduced carbon footprint. It should be noted that, due to the long-term investment strategies in place and the duty insurers have to service existing guarantees in long-term products, some investments held by insurers may not be practically capable of being resold immediately. In addition, we may expect that indirect incentives, like **green supporting or brown penalising factors under Solvency II, might be justified but might not necessarily have the full envisaged effect just by themselves**, as risk capital sometimes plays only a secondary role in investment decisions. However, some assets may become stranded assets and we as actuaries should provide adequate transparency and encourage pension funds and insurers to

anticipate these asset transition risks.

A more effective instrument for the finance industry might be the direct facilitation and development of investments such as specially structured **green bonds relating to debts or loans for transition projects**. To provide attractive solutions for mid-sized and small insurers and pensions funds, governments and Central Banks may need to provide guarantees on such bonds and the credit risk levels of different tranches within such structures will need to be clear. Such structures could make direct support of transition projects more attractive for insurers and pension funds because of their long-term horizon, stable guarantees, attractive interest rate expectations and transaction sizes that may be accessible to smaller undertakings.

Non-life insurance can play a major role **during the transition in protecting companies** against physical losses and by providing supporting services. Here, we believe that underwriting approaches that include ESG criteria in the assessment of risk exposures are important for developing sustainable solutions that price climate change risks appropriately and provide reliable cover for these risks. Companies can use such approaches to judge effectively which climate risks they are willing to take and which >

future effects of climate change they should take into account when pricing or agreeing to insure such risks, as well as the economic capital they need to face these risks.

To address the current lack of sustainability data, i.e., data about whether investments (on the asset side of the balance sheet) or insured exposures (on the liability side) are sustainable or not, and to reach a common understanding regarding which economic activities and which financial products are sustainable or not, we support the development and the use of a science-based taxonomy such as the one initiated by the EU Commission, as well as the establishment of Green Bond standards. Such level-playing rulebooks will also serve the purpose of fighting greenwashing.

CLIMATE PROTECTION GAP

Insurance protection gaps, by definition, are areas in which societal risks are not covered by the insurance industry, either because of lack of penetration, or because the risks are uninsurable in profit-oriented markets. While the former might eventually be covered by normal market forces, the latter can only be covered by public policy encouragement. While we expect non-life insurance to continue to play a major role in protecting individuals and companies against losses arising from natural catastrophes, insurers adopting **well-informed underwriting processes that**

include ESG-criteria may need to decline some coverages. According to a study from EIOPA, only 35% of the risks stemming from natural catastrophes are currently covered by insurance³, partly due to limited attractiveness or accessibility, but also due to the lack of awareness of these risks by individuals or companies.

As climate change risk becomes even more difficult to insure due to climate change trends, some risks may cease to be practically insurable by the private sector alone. In the future it will become even more important for protection against some risks to be provided by the government or through state-supported vehicles. We as actuaries support the early identification of **potential protection gaps** arising from climate change and the development of joint solutions between the insurance industry and public protection facilities where appropriate.

CONCLUSION

Climate change is not just a European issue. Solving the climate crisis will need action not only from European actuaries or European insurance and pensions undertakings. We also need a global view. Ideally, there should be no worldwide inconsistencies or local European regulatory loopholes that can be exploited to manoeuvre around risk-based and scientifically evaluated assessments of any of

the topics mentioned above. We as the AAE stand ready to support development of comprehensive, proper carbon and pollution accounting, valuation approaches and risk assessments to make any such loopholes more transparent. <

³ The pilot dashboard on insurance protection gap for natural catastrophes, 04.12.2020, https://www.eiopa.europa.eu/document-library/feedback-request/pilot-dashboard-insurance-protection-gap-natural-catastrophes_en

AAE-BOARD MEMBER: MATTHIAS PILLAUDIN

He began his career in 2008 as an actuarial consultant, working mainly in non-life and health insurance. He held various management positions before joining CNP Assurances group risk department in 2016 as head of ORSA unit (Solvency 2). In 2021, he joined the finance department as deputy to the head of Actuarial department and more particularly in charge of the IFRS 17 project, organization and management of the department.

In parallel with his professional career, Matthias Pillaudin has been involved since 2010 in the community life of the French Institute of Actuaries and since 2015 in the AAE where he started as member of the insurance committee, then he took responsibility for the non-life working group, and after that for the working group on low interest rates.

He joined the AAE board in 2020 for a one-year term before being elected for an additional 3-year term. At the same time, Matthias Pillaudin became the honorary treasurer of the AAE.



'I strongly support the idea that general interest must guide our work in the AAE, which requires going beyond individual interests. The general interest is, from my point of view, the expression of the general will, which gives to the AAE the mission of building a strong partnership between European organisations and European actuaries.'

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 June 2022. Suggestions can be e-mailed to info@theeuropeanactuary.org. The deadline is 1 May 2022.

EUROPEAN AGENDA

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

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