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EDITORIAL

The walls came tumbling down

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On December 31, 2019, among bouquets of fireworks, the world celebrated the coming New Year. We all exchanged best wishes for a wonderful 2020. Unknown to (almost) all, a new type of virus had just started to conquer the world. Declared a pandemic by the World Health Organization on March 11, 2020, SARS-CoV-2 and the resulting disease COVID-19 have since changed our lives. We all learned about precautionary measures like wearing masks, physical distancing when necessary, and thorough hand washing. Note that I write "physical" not "social": our esteemed colleague Hans Bühlmann rightly refers to "*social* distancing" as the worst choice of words coming out of the pandemic. Reproduction numbers brought exponential growth to the forefront of the daily news bulletins and concern for flattening-the-curve mapped this growth to hospitals' intensive care capacities. Vaccines gave us hope for a return to normality before too long. Meanwhile, the virus' mutations keep marching through the Greek alphabet, having (at the time of writing) reached letter fifteen, omicron. At the moment, COVID-19 is still considered a worldwide pandemic. Predictions are that, like the flu, it will become an endemic disease. When, where, and how this will happen very much depends on factors like a population's level of vaccination and developed immunity. At the same time, we are reminded of the proverb, attributed to many, that "It is very hard to predict, especially the future." This brings us into the realm of the actuarial profession.

As risk is part of our profession's DNA, we should no doubt have been more at the forefront of pre-warning concerning pandemic risk. From a regulatory point of view, pandemic risk was clearly on the table, be it either through stress tests for mortality rates, so-called pandemic shocks, or a requirement for concrete continuity plans in the case of serious business interruption. Moreover, various publications stress the fact that flu pandemics occur more frequently than we think (Marani *et al*., 2021). Before the occurrence of the current pandemic, many had already forgotten that the 1968–1969 Hong Kong flu pandemic caused an estimated two million deaths worldwide. From the various documents published on the topic before 2020, there was a consensus that a flu pandemic could occur at any time. At the same time, this consensus was coupled with the expectation that, in the event, modern society would be sufficiently resilient to master the consequences. Most unfortunately, it became abundantly clear that many, if not most, countries were not at all prepared. The social and political fabric of our society showed serious cracks, which further widened through the spreading, on ubiquitous social networks, of highly misleading and often false information. Politicians in pursuit of dubious goals further amplified this. On several occasions, I was reminded of Galileo Galilei's letter of August 19, 1610, to Johannes Kepler in which he complained that the adversaries of heliocentrism refused to look for themselves

through a telescope. Although the actuarial community tries hard to counter misinformation[1], evidence-based communication had, – and still has – a very difficult stand in getting its message across[2].

It is no surprise that, in the meantime, pandemic risk made it right to the top of the various insurance-risk hit parades. Up there it competes for first place with other newcomers like cyber risk and supply chain risk. Concerning the former, society's increasing dependence on Information Technology (IT) makes all of us highly vulnerable to cyber risk in an ever more computerised and interconnected world. From very early on, schoolchildren are taught how to safely cross a road, where the obvious and clearly visible risks are cars and other vehicles. When it comes to safety guidelines concerning invisible risks that are omnipresent whenever we use a smartphone or a computer, society takes a much more relaxed approach. This leads to all of us crossing, blindfolded, a dangerous IT-road dozens of times each day. Supply chain risk on the other hand became very visible in a rather dramatic way when, due to strong winds, on March 23, 2021, the container ship Ever Green managed to get its bow stuck in Asia and its stern in Africa. For six days, passage through the Suez Canal, one of the most important trading routes for cargo worldwide, was blocked. This caused serious ripple effects, still felt today, on the world's markets. Through a shared IT infrastructure between suppliers, manufacturers, distributors, retailers, auditors, consumers and, of course, insurers[3], blockchain technology enabled a considerable growth in supply chain management. Furthermore, the big data revolution, accompanied by machine learning and neural networks, poses new challenges to the actuarial profession (Wüthrich & Merz, 2019; Maynard *et al*., 2022). So much so that top management in some insurance companies has voiced the need to increasingly replace actuaries by data scientists; this is "Another brick in the wall" (thank you Pink Floyd) we as a profession cannot allow to fall.

I used to define the Actuary of the Fifth Kind as "A data-driven and model-guided, critical and socially responsible financial decision-maker, in an ever-changing world governed by uncertainty." This definition combines nicely with Frank Mitchell Redington's famous quote "An actuary who is only an actuary is not an actuary." Actuaries across the globe, their national and international associations as well as academia have taken up the data science gauntlet. The "data-driven" in the above definition of an actuary has always been there, from the beginning of the actuarial profession. However, we do have to adhere to our basic actuarial principles within the big data revolution. This is in line with the true meaning of Frank Redington's quote.

On January 28, 2022, Professor Sir David Cox died, aged 97 years. The influence of Professor Cox's scientific contributions to the actuarial profession is considerable. He was elected an Honorary Fellow of the Institute of Actuaries in 1990. Asked about the most important recent developments in the field of statistics, in a 2014 interview[4], he brought up the topic of big data and stated that "Big Data will bring forward new ideas but it does not mean that old ideas from the more traditional part of the subject are useless." The title of the above interview is worth recalling: "I like to think of myself as a scientist who happens largely to specialize in the use of statistics."

Modern society no doubt offers many new challenges for actuaries (Embrechts & Wüthrich, 2022). Examples include supply chain insurance, crop insurance, longevity bonds, the evolving world of catastrophe insurance, pandemic bonds, parametric insurance, innovative pension schemes in a historically low interest rate environment, and the always-present market for insurance-linked securities. Areas like personalised medicine and telematics for auto insurance are just born, drones take to the sky, and robots replace humans at an increasing rate. Several

[1] https://www.covidactuaries.org.

[2] The following book project is relevant here: Embrechts, P., Hofert, M. & Chavez-Demoulin, V. (2022). Risk Revealed: Cautionary Tales, Understanding and Communication, Cambridge University Press, to appear.

[3] For example, https://b3i.tech/.

[4] https://www.statisticsviews.com/article/i-would-like-to-think-of-myself-as-a-scientist-who-happens-largely-to-specialise-in-the-use-of-statistics-an-interview-with-sir-david-cox/.

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of these developments are driven by big data and data science. The only viable way forward is for actuaries to embrace data science techniques in a critical way. A key actuarial anchor point remains that an insurance product by (legal) definition offers a policyholder the relief of financial loss due to risks encountered. These products have to be well defined, technically understood, properly marketed, regulatory approved, correctly priced and reserved, as well as clearly communicated. On top of these, actuaries also have to consider the societal implications of the products developed; here looking back at the overcomplicated and often economically useless products invented by investment banks towards the end of the 2007–2008 financial crisis come to mind. In line with the comments above by Professor Cox, this will always call for the need of actuarial understanding. We simply cannot allow a tumbling down of our actuarial walls of professional responsibility. They support an absolutely fundamental part of our social welfare system.

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