International Actuarial Association
Association Actuarielle Internationale

Pandemics Task Force: Lessons Learned

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Personal introduction

- 53 years old, lives in Nieuwegein (Netherlands)
- Since 2017 working at Achmea:
- As Actuarial Function Holder for:
  - Achmea Schadeverzekeringen N.V.
  - N.V. Hagelunie
  - Achmea Reinsurance Company N.V.
- In 1996 Econometrics Erasmus University
- Between 1996 en 2017 Actuary at Nationale Nederlanden and Movir, of which first 15 years as Non-Life actuary and the last years as Life Actuary.
- In the past member “Actuariële Commissie Inkomensverzekeringen” at Verbond van Verzekeraars
- Currently Chair “Commissie Verzekeringen” at AG
- Member of the Pandemic Task force of the International Actuarial Association (IAA)

Presentation Overview

- About the IAA Pandemics Task Force (PTF)
- PTF activities
- PTF's first project: "Lessons Learned" report
  - Goals
  - Main lessons
  - Conclusion

About the IAA Pandemics Task Force

Pandemics Task Force

- Kicked off in Summer 2022; will sunset at the end of 2024
- Members from five continents and nine countries

These papers was prepared by the Pandemics Task Force of the International Actuarial Association (IAA).
Lessons Learned from Pandemics - July 2024 - This is an educational paper intended for an audience of actuaries, especially those who may not have been closely involved with pandemics research or analysis, as well as non-actuarial stakeholders who wish to consider the actuarial response to future pandemics. The COVID 19 Pandemic as well other pandemics such as HIV/AIDS and the 1918 influenza pandemic have brought several critical factors into play that have reshaped global perspectives and responses. This paper provides a high-level retrospective of the lessons we have learned to date, offering valuable insights for future preparedness.
Implications of COVID-19: Protection Gaps, October 2024 - The COVID-19 pandemic revealed significant gaps in the global insurance framework, exposing vulnerabilities in the ability to provide coverage for unprecedented economic losses. This educational paper explores these “protection gaps” and highlights the limitations of the insurance industry across property and casualty, life, and health insurance sectors as well as governments in responding to a large-scale crises such as the pandemic.
Implications of COVID-19: Data and Modeling a Pandemic – DRAFT - This paper draws out lessons from COVID-19 in terms of data and modeling. In particular, it identifies issues that may need to be addressed to improve quality and quantity of data, allowing stakeholders to make quicker and better decisions. The paper also focusses on model features that could provide more accurate measures of risk. The intended audience for this paper includes actuaries and supervisors but should be of interest to other relevant stakeholders in the insurance industry, epidemiologists, public health experts and the medical profession.

Lessons Learned from Pandemics

Lessons Learned from Pandemics: Outline

1. Modelling, data and reporting
2. Practice Area-specific issues:
   - Life insurance and mortality
   - Pensions and social security
   - Health care
   - General insurance and property/casualty
   - Enterprise risk management
3. Broader economic and societal impact
4. Financial sector resilience
5. Intersection with other societal and environmental issues

Lesson 1: Data (1/4)

- Asymptomatic spread of the disease meant daily COVID-19 case figures were unreliable and not representative of infections.

- Incomplete death reporting early in the pandemic, and in developing countries, led to underestimating the morality impact of the pandemic.

- Many disparate data sources and apparent counterintuitive data required interpretation.

- Misinformation also emerged as a serious problem.

Lesson 1: Data (2/4)

- Actuaries played a role by communicating the problems and potential biases of mortality data.
- The work of the COVID-19 Actuaries Response Group provides examples of this such as highlighting the need to focus on excess deaths due to reliability issues of the reported deaths at the time.

- They also showed how counter-intuitive mortality outcomes were explained by Simpson's Paradox. Simpson's Paradox is when a relationship appears within individual groups of data but disappears or reverses when the groups are combined. This led the Office for National Statistics in the UK to publish mortality rates by narrower age bands since broader age bands resulted in the general increase in mortality rates by age swamping the differentials caused by vaccination coverage.
- Actuarial associations in various other countries also formed groups that reviewed and discussed emerging models and interpretation of data.

Lesson 1: Data (3/4)

Actuaries contributed significantly to sharing and presenting useful analyses based on data emerging from the pandemic.

Examples:

- Various efforts to monitor population excess deaths in the UK, Australia and South Africa
- Producing other dashboards and metrics such as the regular updates on hospital admissions produced by COVID-19 Actuaries Response Group and shared on social media or estimates produced on the reproductive number in South Africa.
- Projections such as those published by the Royal Dutch Actuarial Association' AG Mortality Research Committee

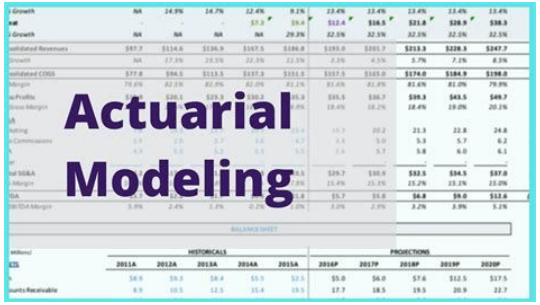
Lesson 1: Data (4/4)

Lessons Learned

- Actuaries realised that reported deaths and hospital admissions as data sources were less likely to contain biases than case counts where case definitions were inconsistent.
- Even reported death data presented some challenges in developing countries as well as early on in developed countries.
- Focussing on data sources based on serious outcomes allowed actuaries to present more balanced views as things changed rapidly over the pandemic.
- In both HIV and COVID-19 pandemics, collaborating with those across various professions involved in the dissemination and production of data was key.
- As evidenced by the work of the COVID-19 Actuaries Response Group, it also became clear that actuaries can contribute significantly to the discourse in social media, which played an important role during the crisis.

Lesson 2: Modeling (1/2)

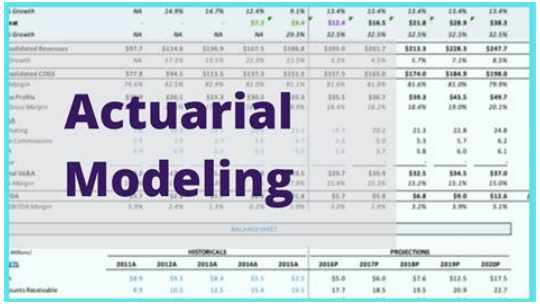
- The number of studies modeling the epidemic and/or trying to identify the best responses has been growing rapidly.
- Actuaries have been debating alternative ways to assess the risks associated with the virus, including assets and liabilities of pension funds and insurances, as well as the impact of mortality and morbidity rates on social protection systems.



- As the COVID-19 pandemic developed models were compiled by teams including epidemiologists, mathematicians, data scientists and medical researchers and drew upon local and global data sources.
- One of the early COVID-19 models developed by actuaries was that of the Actuarial Society of South Africa following in the footsteps of actuarial models for the HIV/AIDS epidemic. The model used Bayesian modelling techniques which allowed the combination of uncertain prior information with the data to develop estimates for uncertainty on parameters and the projected outcomes.
- Actuaries also assisted with modelling various vaccination strategies in France.

Lesson 2: Modeling (2/2)

Lessons Learned

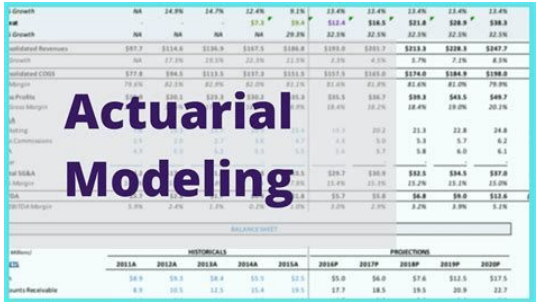


- Models allow actuaries to infer what is driving experience as well as consider alternative future actions could impact outcomes allowing actuaries to advise decision makers of actions that can save lives.
- Actuaries have a role to play while collaborating with other professions in future pandemics and can provide valuable insights to the public and other professions.
- Actuaries should also engage professionally in public discourse, while balancing the need to be relevant and timely with the right of quality work. Such work is appreciated and recognised outside the profession as exemplified by the awarding of the MBE to Stuart McDonald of the IFoA for his contributions on COVID-19. Hopefully an inspiration for actuaries!

Lesson 3: Pensions and social security (1/2)

The COVID-19 pandemic affected pensions and national social security arrangements in multiple ways including:

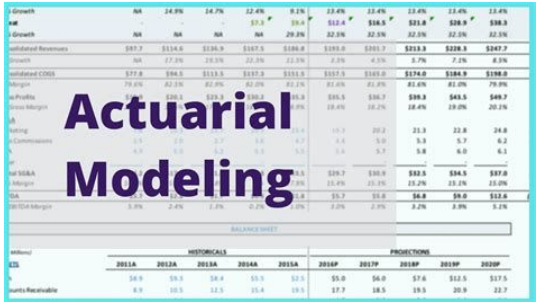
- Issues of governance of plans, both private and public, during periods of lockdown and working from home;
- Consequences for inflation and the economy;



- Work absences and business interruption and their impact on retirement contributions, both of members and employers;
- Increased short-term levels of early retirement from the labour force, on both specific grounds of ill-health and otherwise, as well as potential changes in retirement behaviour for the future;
- Impact of short and longer-term sickness on payment of contributions, as well as on entitlement to sickness benefits;
- Higher than expected experienced levels of mortality, for active scheme members and pensioners and for those with a deferred entitlement, as well as potential longer-term impact on life expectancy assumptions.

Lesson 3: Pensions and social security (2/2)

Lessons Learned



- Pension funds and social security plans, and their administration, proved surprisingly adaptable in the face of the challenges of the pandemic.

- Retirement issues need to be considered in tandem with financial wellness. Financially fragile people are likely to be much more impacted by a pandemic, and may view retirement funds (if they are available) as a source of emergency funds. Government support is very important and there are a variety of different ways to provide such support.

- Pandemics can change when and how people expect to retire, and this must be expected and built into projections of retirement plans.

Lesson 4: Health Care (1/2)

- Impact on health care delivery
- Impact on health insurance

- Impact of vaccines
- Long Covid
- Pandemic resilience per country

Lesson 4: Health Care (2/2)

Lessons learned

- Public health funding in many countries enabled the availability of health care services such as testing, treatment and vaccinations. Actuaries can support public health finance systems to ensure accurate cost projections and equitable distribution.

- Risk management strategies must be incorporated into the health care delivery system to mitigate the impact of a pandemic emergency and prepare these systems for a future pandemic. Nursing homes and hospitals were especially vulnerable to COVID-19.
- Actuaries can use demographic models to help governments and health systems optimally deploy vaccinations as well as testing and treatment or other potential tools that may be useful in future pandemics.

Lesson 5: Non-Life insurance (1/2)

- Businesses were not prepared for closures
- Businesses didn’t know what to do with employees

- Experience behaved in unexpected ways: example less car accidents
- COVID-19 Insurance

Lesson 5: Non-Life insurance (2/2)

Lessons learned:

- Business interruption coverage may not be insurable in the private market. Governments may need to be prepared to step in and assist.

- Offering insurance directly in response to infection can be very risky in a pandemic situation.
- The pandemic began a shift to remote work, but the cessation of the pandemic may not mean a return to normal.

Lesson 6: Intersection with Other Societal and Environmental Issues (1/2)

- Interactions between a pandemic and other risk events can lead to feedback loops and tipping points. These need to be carefully watched and modelled

- Anyone who deals with risk should be prepared to deal with *threat multipliers* -- risks that interact with and make other risks worse.
  - Examples: Pandemics, climate change and energy risk

Lesson 6: Intersection with Other Societal and Environmental Issues (2/2)

- The world is an interconnected place, with physical and financial risks each impacting the other. Plans that anticipate socioeconomic differences and think about changing demographic and climate assumptions will be better able to develop solutions. Some key considerations include:
- The world doesn't stop during a pandemic. Other risks will continue to evolve and interact with a pandemic.
- Indirect health impacts and consumer behaviour matter and should be planned for.
- Scenarios should be developed based on future expectations, building from past pandemic experience with input from a variety of perspectives.
- Pandemic risk belongs to the category of so-called threat multipliers: risks that interact with and make other risks worse. Responses to a pandemic could affect both the frequency and severity of other risks.

Conclusions contributions of Actuaries

- Communication in problems and biases in data.
- To point out which data is appropriate
- Collaborating with other professions
- Be part of public discourse (also social media)
- Fast developing and adjusting models to give insights in the development of the pandemic
- Developing models to help vaccination strategies
- Incorporating Risk Management strategies into the health care delivery system
- Developing and adjusting scenarios based on COVID-experience

Follow up Dutch Actuarial profession?

- How can we as Dutch Actuaries give a follow-up of these conclusions?
- Preparing a plan coordinated by the Royal Dutch Actuarial Association?
- Involving stakeholders? Which one?
- How to connect with foreign actuarial associations? Via IAA?