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Implications of COVID-19 Data and Modelling a Pandemic

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Pandemics Task Force

Members from five continents and nine countries
Chair: Sara Teppema (US)
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IAA Staff Liaison: Amali Seneviratne

Pandemic Task Force (cont'd)

- Task Force first established at IAA meeting in Brussels in May 2022
- Started work early 2023
- Has sunset at year-end 2024 but completing last paper (3rd)
- First paper "Lessons Learned from Pandemics" released on July 29, 2024
- Second paper "Implications of COVID-19 Protection Gaps" released October 2024
- Third and last paper "Implications of COVID-19 Data and Modelling a Pandemic"; currently reviewing comments from FMAs

Implications of COVID-19 Data and Modelling a Pandemic

Data & Modelling paper

Main authors:

- Chris Daykin MA Hon DSc FIA FSA (UK)
- Dale Hall FSA (USA)
- Kees Thiers MSc (Netherlands)
- Kasun Amarasuriya FIAA (Australia)
- Ash Bhalerao FIAA (Australia)

Data & Modelling paper (cont'd)

- Executive Summary
- Introduction
- Data needed and how to improve quality
- Enhancing/improving existing models and how actuaries can assist
- Independent audits of projections by others
- Sharing learnings across time and countries
- Scenario building
- Conclusions
- Appendix

Data & Modelling paper (cont'd)

- Executive Summary
- Pandemics cause massive health care crisis requiring significant analysis and quick decision making with public and private sectors
- Data quality and quantity, some model features could be improved
- Key definitions and parameters could be approved among jurisdictions
- Models could be improved with extra features; some parameters need to be "country specific"
- Since outcomes are unpredictable, scenario testing is required
- For all of the above, actuaries can assist

Data & Modelling paper: Introduction

- As with all PTF papers, seeking lessons learned from COVID-19
- More and better data help decision makers act quicker and make better decisions
- Some model features improve risk measuring
- Actuaries could make positive contributions
- Contribute to cooperation and coordination among stakeholders
- Intended audience: actuaries, supervisors, public health experts…

Data Needed and How to Improve Quality

- Ideal world: complete and consistent data
- Would know cause of death (CoD), number of deaths, exposed population counts, number of completed tests, number of positive cases detected…
- Rarely available particularly in early stages of pandemic
- Lack of testing results in inaccurate CoD
- Data rarely available in complete and consistent format within/among jurisdictions/countries
- Setting broad principles-based approach would improve global communications; IAA could play a coordinating role

Data Needed and How to Improve Quality(cont'd)

- Consistency of data sets
- Setting broad principles-based approach to improve global communications
- Define pandemic-related deaths, location of deaths, identify populations tested to measure positive test results
- IAA could play a coordinating role
- Tracking indirect impact of pandemic on mortality/morbidity also important for decision-makers
- Tracking "excess deaths" has benefit of not relying on clearly tracking pandemic–related deaths but requires monitoring mortality in prior years

Data Needed and How to Improve Quality(cont'd)

- Tracking "excess deaths" has benefit of not relying on identifying pandemic–related deaths but requires monitoring mortality in prior years
- Data for this is less ambiguous and more easily standardized
- Supranational organizations (such as IAA) can help entities develop required infrastructure and set key definitions
- Approach facilitates comparisons among countries
- NB must focus on variations in rate of mortality not in number of deaths

Improving Existing Models

- Paper describes different stages in building effective models and identifies in which stages actuaries can be of most assistance
- In early stage of pandemic, simplified models such as curve fitting can be useful
- Although some actuaries are experienced coders, they may be more useful as intermediaries between coders and users
- Good experience in assessing parameters that may be conceptually inappropriate
- Good at peer reviewing/validation

Independent Audits of Projections by Others

- Auditing models/projections of others is familiar to many actuaries (Solvency II internal models, Insurance Capital Standard…)
- Could bring different thoughts/views
- Professionalism standards

Sharing Learning across Times and Countries

- Report discusses the model sharing that took place in late ‘80s when many countries/actuarial associations were trying to project HIV infections and AIDS development and deaths
- Draws parallels and differences between HIV/AIDS and COVID-19
- Speed of COVID development did not allow much international cooperation on research
- Countries left almost on their own resorted to various approach to contain spread
- Data comparison between countries was difficult because lack of consistency; number of deaths but no rate of death

Scenario Building

- Highlight our experience building scenarios to illustrate variability in outcomes; may assign different probabilities to each outcome
- Test sensitivity to key assumptions; identify potential uncertainty
- Essential to effective risk management

Conclusions

- Data is critical to decision-making
- Without proper context, data communication may be misleading
- Actuaries are familiar with data issues/biases
- Uncertainty in model projections of outcome
- Sensitivity testing, identification of key drivers and varying weights of outcomes help
- Actuaries abide by strong code of professional conduct and are used to working within multi-disciplinary teams

Thank you! Obrigado!

Questions?

Speaker Contact Details (Optional)