



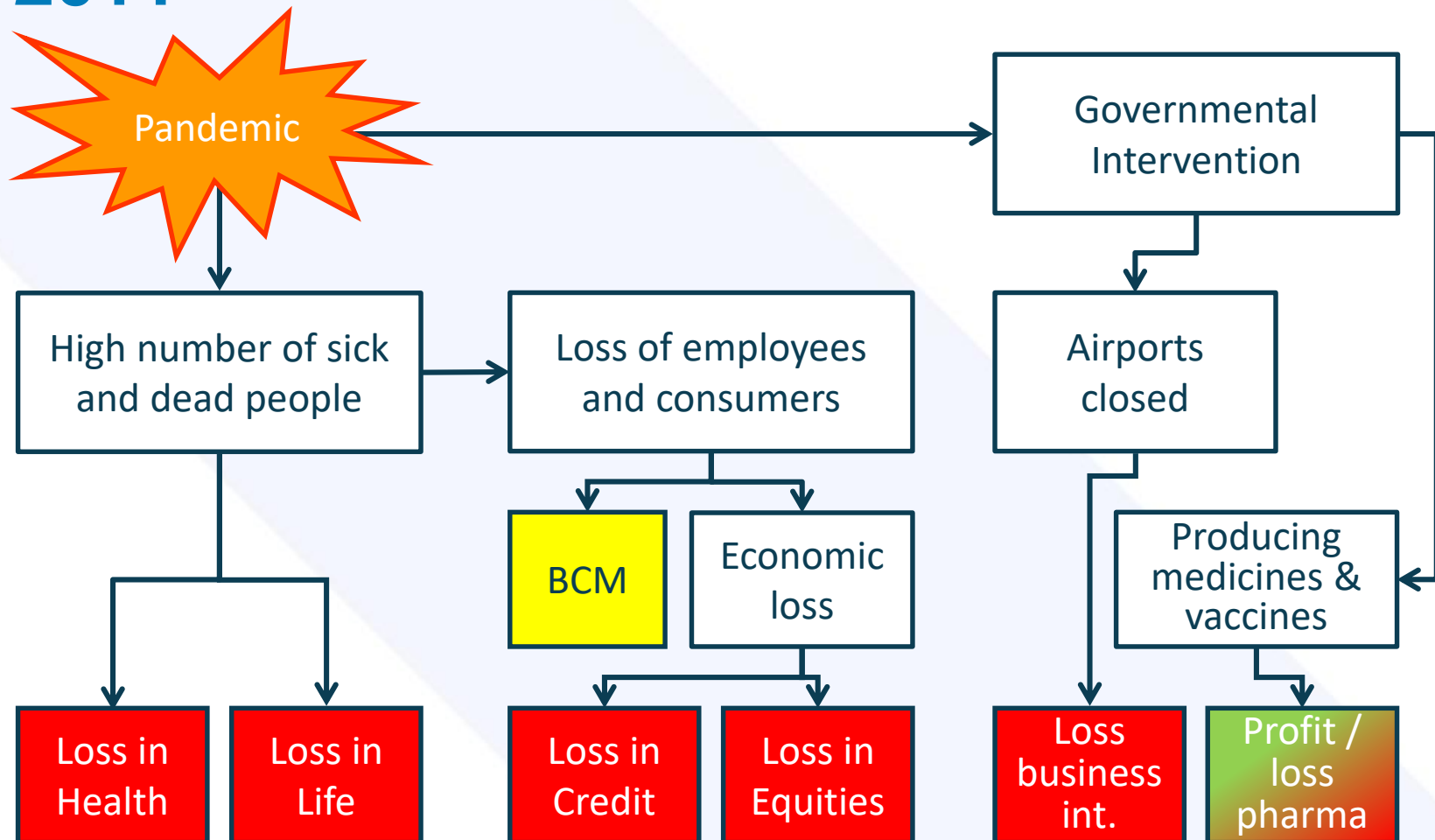
ACTUARIAL ASSOCIATION OF EUROPE

How to Survive a Pandemic as Risk Manager?!

Dr. Frank Schiller, Vice Chair of the AAE Risk Management
Committee

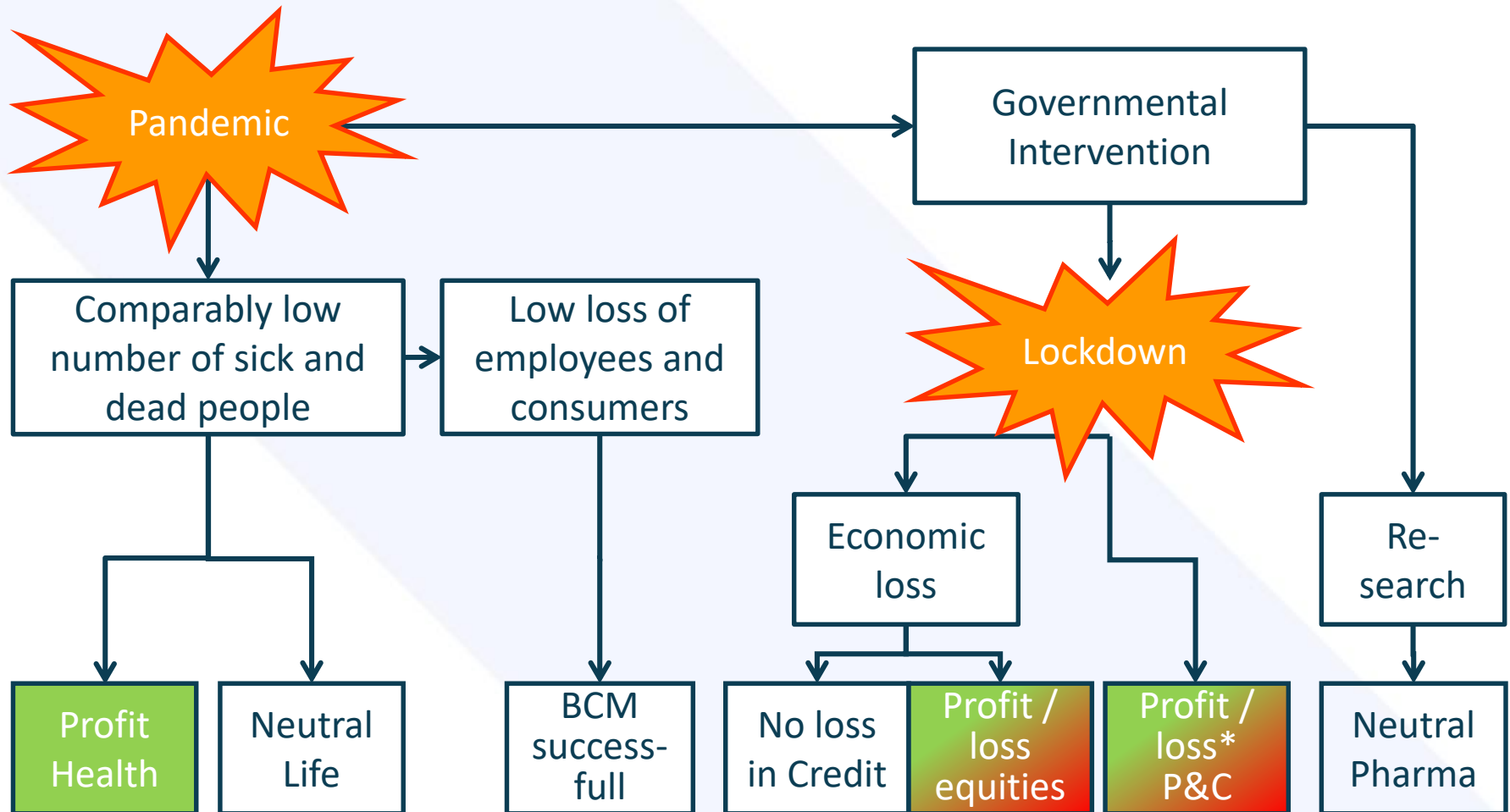
Webinar of the AAE Risk Management Committee, 8 December
2020

Modelling Pandemics CERA Training 2011



Reality during COVID-19 crisis in 2020

No forecast for the rest of the year or the further course of the crisis!



* mostly motor vs. credit, business closures and event insurance

What makes a pandemic difficult to manage

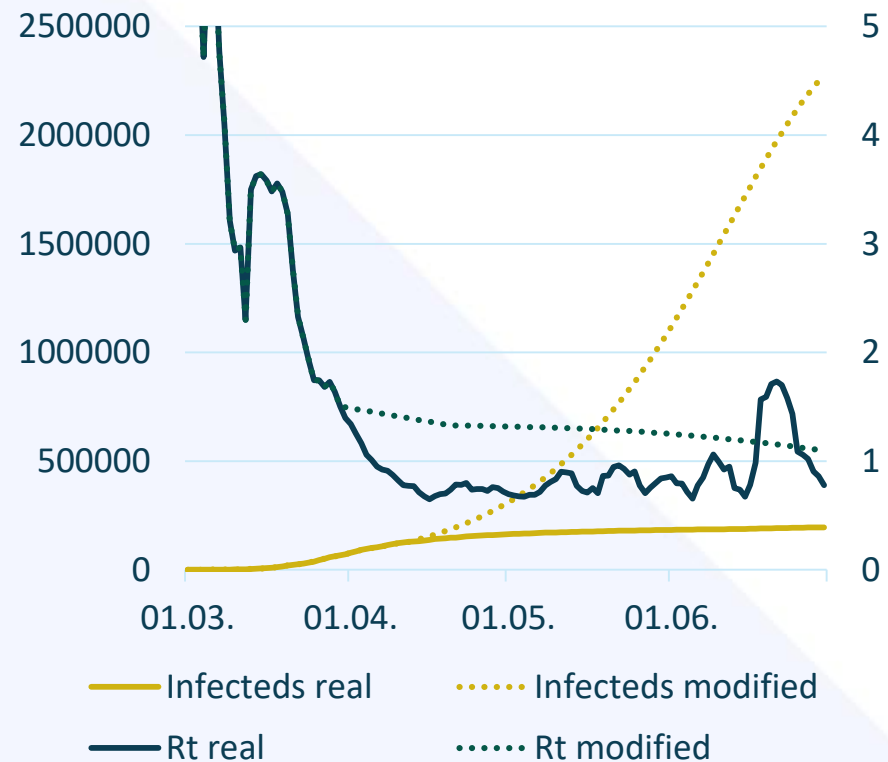
Government measures have a major influence on the course of events. The lock-down was crucial to control the pandemic.

A less strict lock-down would have significantly

altered the course of the pandemic.

$R_{1-\text{Apr}} = 1.5$ would have increased the number of infected persons 11.6-fold from 195,418 to 2,277,439 – the maximum number of newly infected persons daily would have increased 6.4-

Course of infected persons in Germany with slightly modified choice of R_t



Source: Johns Hopkins, own calculations

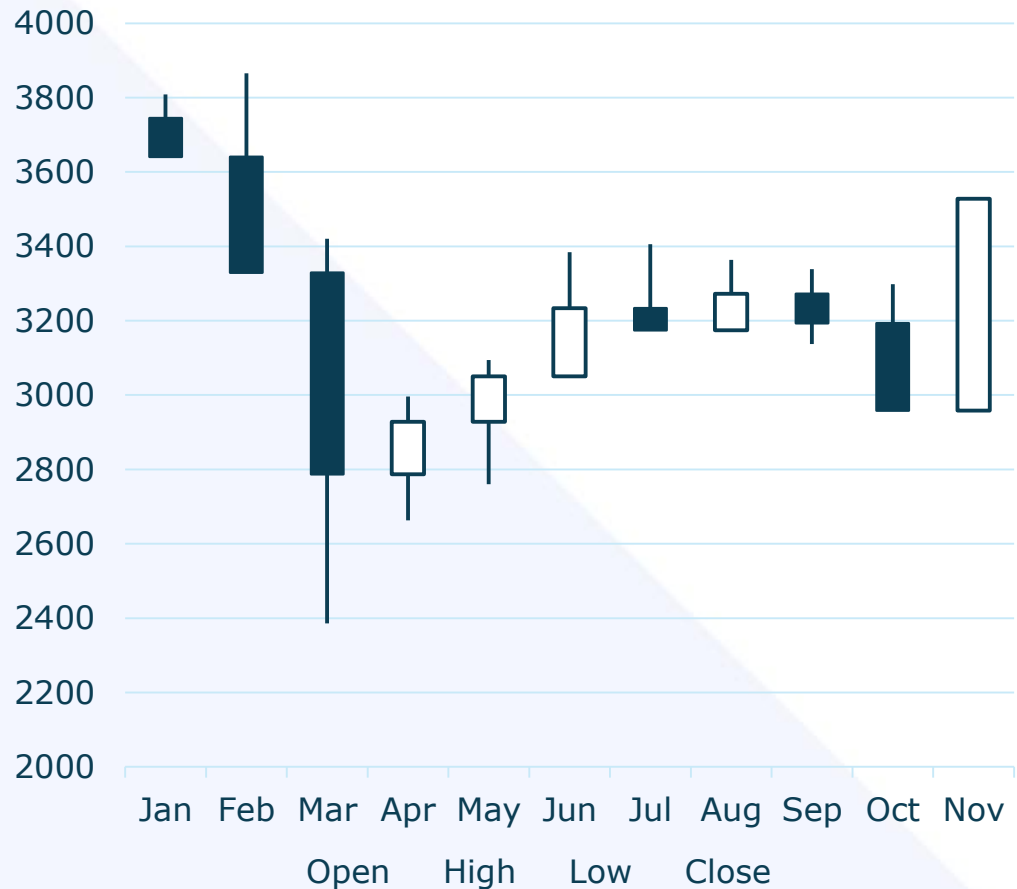
What makes a pandemic difficult to manage

None of us have any experience with a pandemic. Market participants and politicians react to it unpredictably.

It is impossible to estimate how a pandemic will affect the market.

The Euro Stoxx 50 fell by 38% from its high in February at 3,865 to a low in March at 2,386. In the meantime the share price has nearly recovered at

Euro Stoxx 50 in 2020



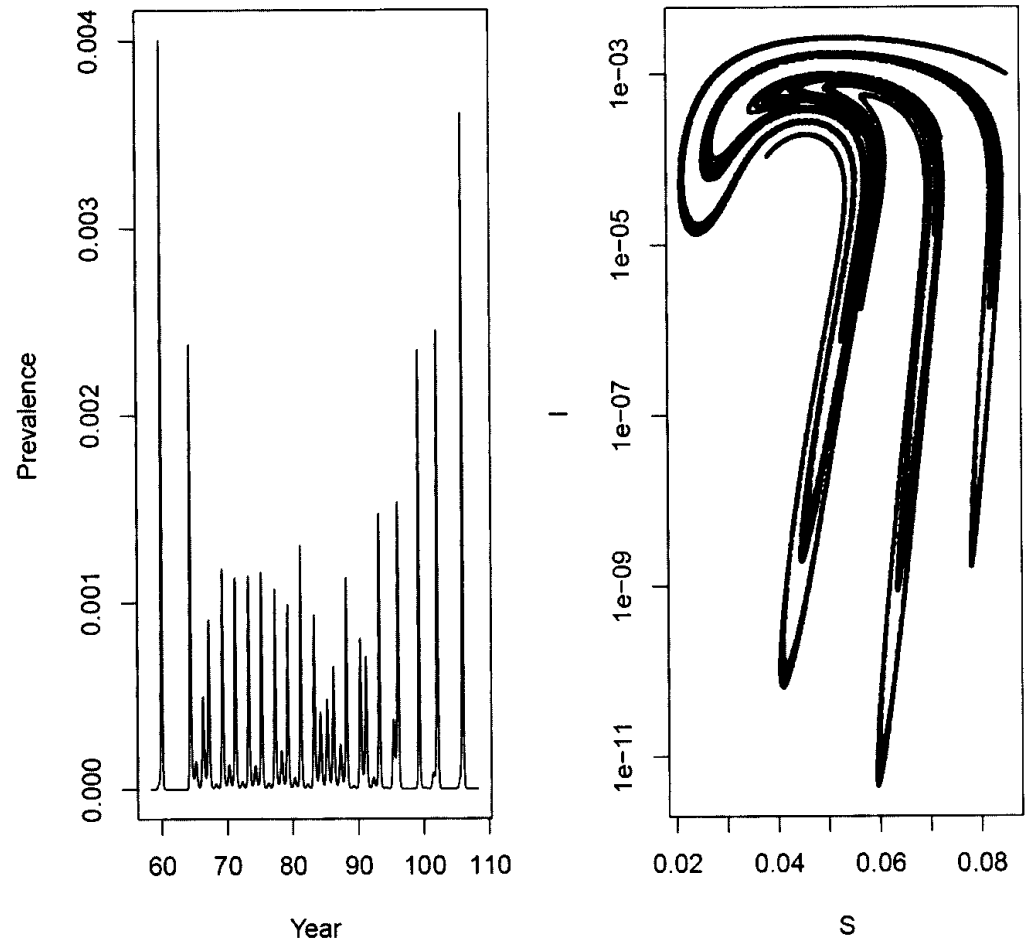
Source: <https://www.boerse.de/historische-kurse/Euro-Stoxx-50/>, 1 Dez 2020

What makes a pandemic difficult to manage

Even in simple pandemic models such as SEIR, the course of a pandemic depends non-linearly on states and parameters.

Small deviations have a major impact on the

Pandemic is like the weather, only slower in development. It is impossible to make a long-term forecast of a pandemic.



A Pandemic is VUCA



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Volatile
Uncertain
Complex
Ambiguous

A strategy to deal with
this is also VUCA:

Vision
Understanding
Clarity
Agility

1. Vision

The pandemic not only causes problems, it also offers opportunities:

- **Risk profile and positioning:**
A clear picture of risk appetite is developed and the company positions itself accordingly with products and services.
- **Reputation:**
 - customers see greater benefits from the insurance services offered and
 - the company can position itself as reliable and stable in the capital market.
- **Processes and workflow:**
Digitalisation and automation are more focused and the company's productivity can be improved more quickly.

2. Understanding

Not only the risk drivers of the pandemic, but also the general economic context will be better understood by a crisis.

- The focus is on **key risk drivers**.
- Relevant risk drivers are identified with **high frequency**.
- The **causal dependence** of balance sheet items on these drivers is analysed in detail and **short-term forecasts** become more stable.
- For the **long-term analysis**, extensive **scenario-based assessments** make it clear how broadly the balance sheet result or the solvency ratio, for example, can deviate and what the causes are.

3. Clarity

Topics are handled with consistency and clear governance, internal communication is open and with the necessary transparency.

- A **crisis management team** is clearly mandated and the processes and roles for dealing with the issues are defined.
- Tasks are handled with **agreed priorities and timetables**.
- Hypotheses, scenarios and results of the analyses are **transparent** to all in accordance with a "**need-to-know**" **principle**, even at short notice, so that new findings can be consistently translated into measures.

4. Agility

Long-term planning without error tolerance is not possible. An agile way of working and controlling the topics is necessary.

Extract from the principles of the agile manifesto:

- Welcome **changing requirements**, even late in development. Agile processes harness changes to their advantage.
- Deliver **working solutions** regularly within short time spans.
- Experts and users must **work together** on a daily basis.
- The most efficient and effective way to **communicate information** is face-to-face.
- The best solutions emerge from **self-organising teams**.
- At regular intervals, the **team reflects** on how to become more effective, then tunes and adjusts its behaviour accordingly.

The pandemic has come to stay

It is amazing how many organs the virus can infect -
and also a little worrying.

(Ulrike Protzer, Helmholtz Zentrum Munich)

Even in younger patients it sometimes takes many
months before the lungs and respiratory muscles are
fully functional again.

(Michael Dreher, Director Uniklinikum Aachen)

We have been somewhat lax in thinking about herd
immunity

(Kate Langwig, Virginia Polytechnic Institute and State University)

It turned out that all the things we were
working on were not what we really
needed

(Ryan Morhard, Expert for Biosecurity)

Five questions that remain unresolved:

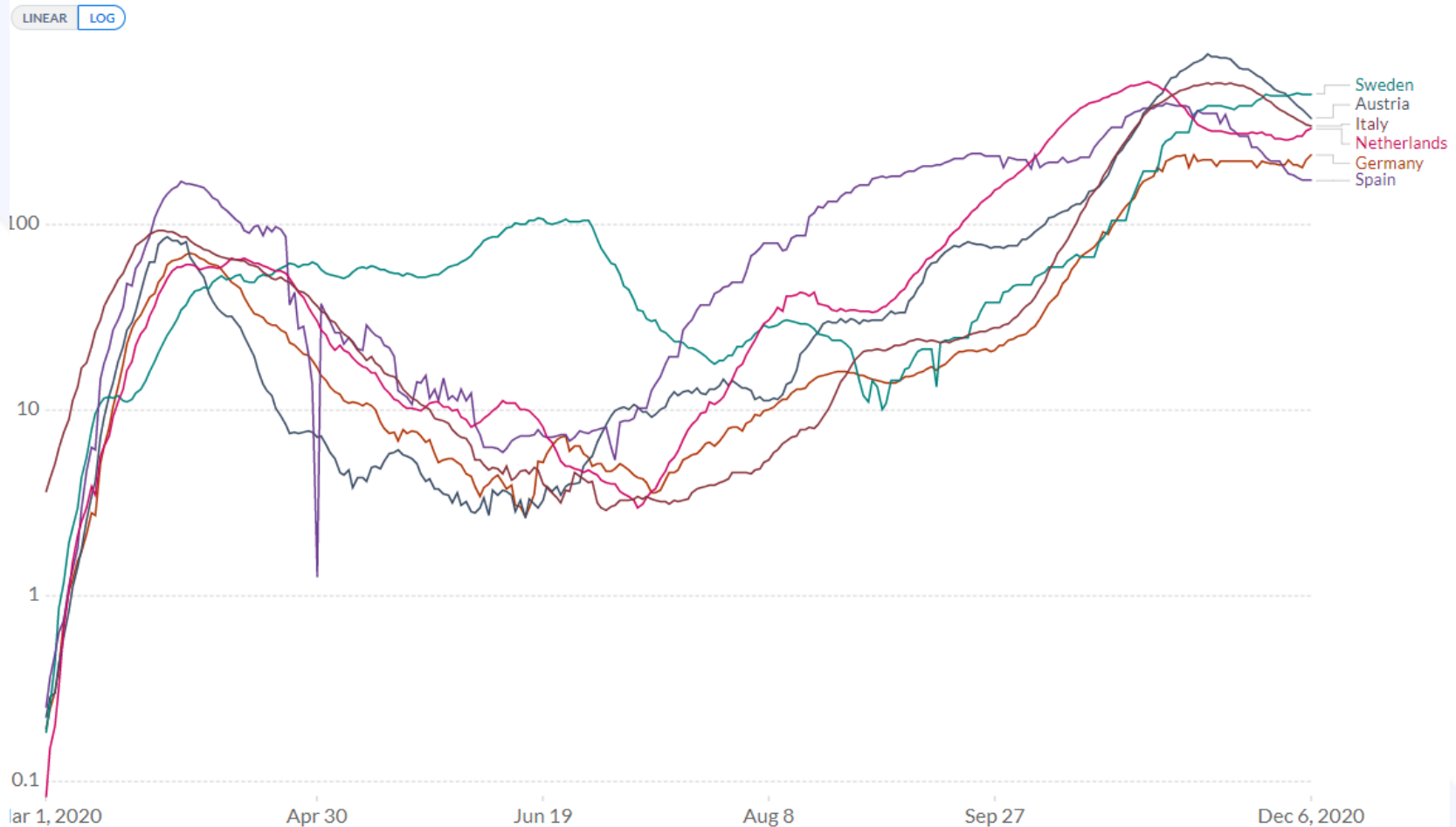
1. Why do people react so differently to the virus?
2. How does immunity come about and how long does it last?
3. Must one worry about mutations?
4. How well will a vaccine work?
5. Where does the virus come from?

Different paths lead to the desired outcome?

Daily new confirmed COVID-19 cases per million people

Shown is the rolling 7-day average. The number of confirmed cases is lower than the number of actual cases; the main reason for that is limited testing.

Our World
in Data



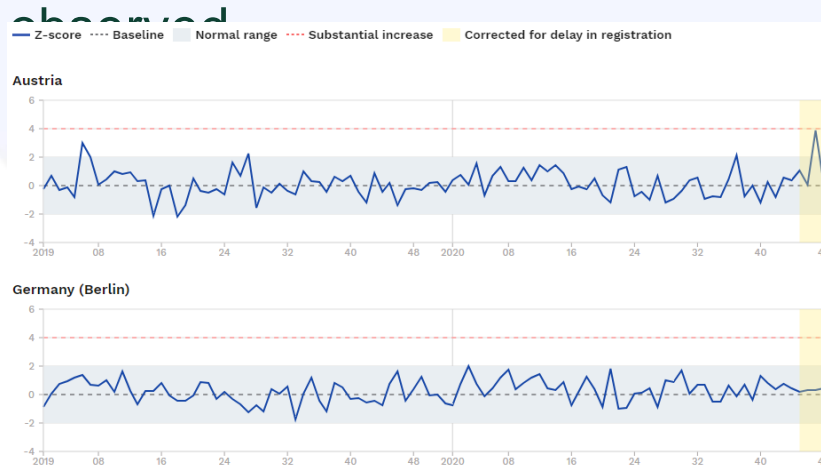
Source: Johns Hopkins University CSSE COVID-19 Data – Last updated 7 December, 06:06 (London time)

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Source: <https://ourworldindata.org/coronavirus>, 08.12.2020

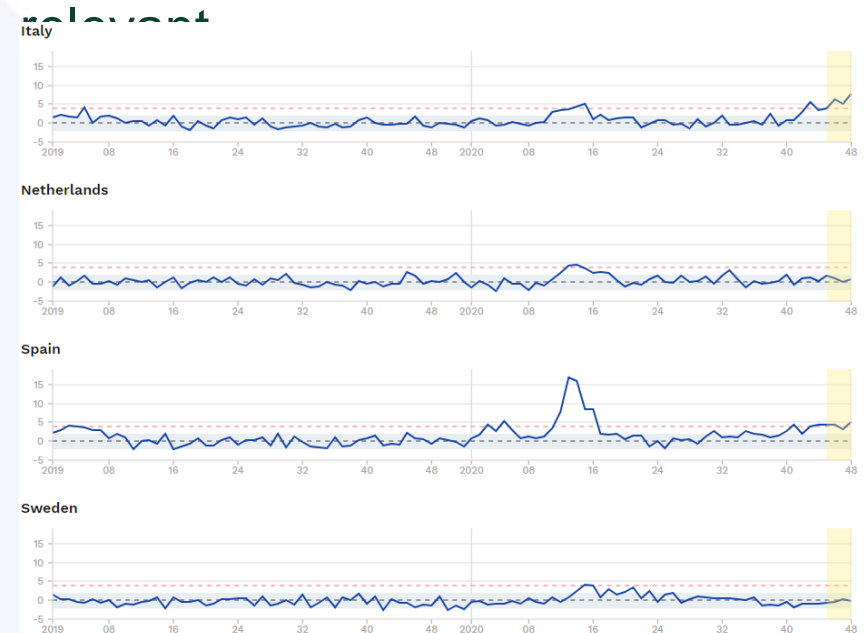
The situations differs materially between European countries

In Austria and Germany still nearly no higher mortality rates are observed



The Z-score is the deviation of the empiric mean normalized by the empiric standard deviation.
All time series for age group “45-64 years”.

In Italy, the Netherlands, Spain and Sweden waves are statistically relevant



Outlook

In the short term, we must adapt processes to the new situation:

- Forecasting and planning must deal with uncertainty
- Carry out ORSA ad hoc if necessary, adapt risk reporting

During the pandemic, actuaries will have to reorient themselves:

1. **Not everything can be modelled** and thus calculated
2. **Not everything can be planned** and controlled via processes
3. **Mistakes are inevitable** and we must deal with them

But changes always mean opportunities:

- **New profiles** are needed for actuarial work and **new development opportunities** are offered
- A rough but broad **overview of everything** is important and makes our work **more exciting**



Thank you for your attention

Dr. Frank Schiller