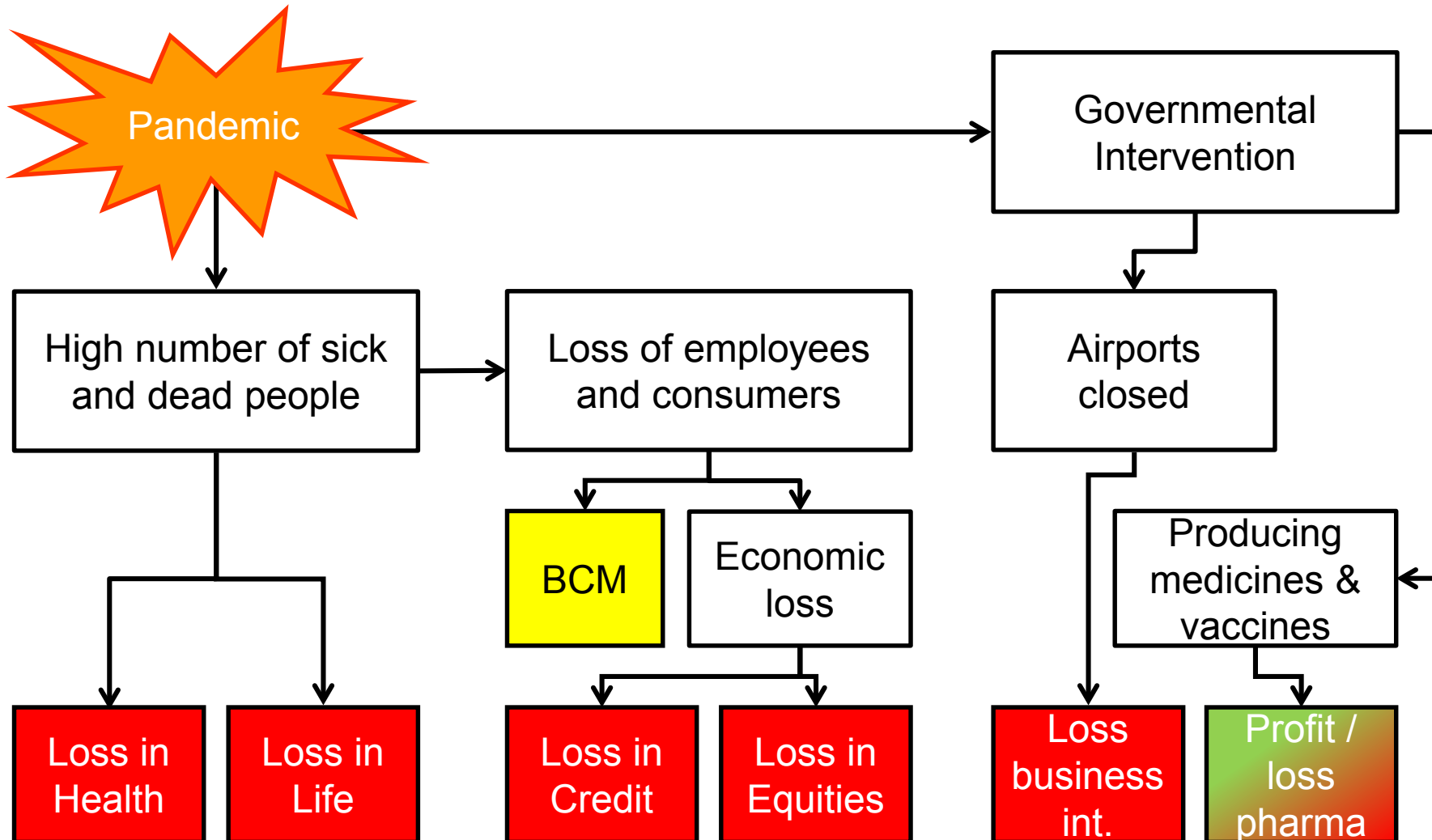


How to Survive a Pandemic as Risk Manager?!

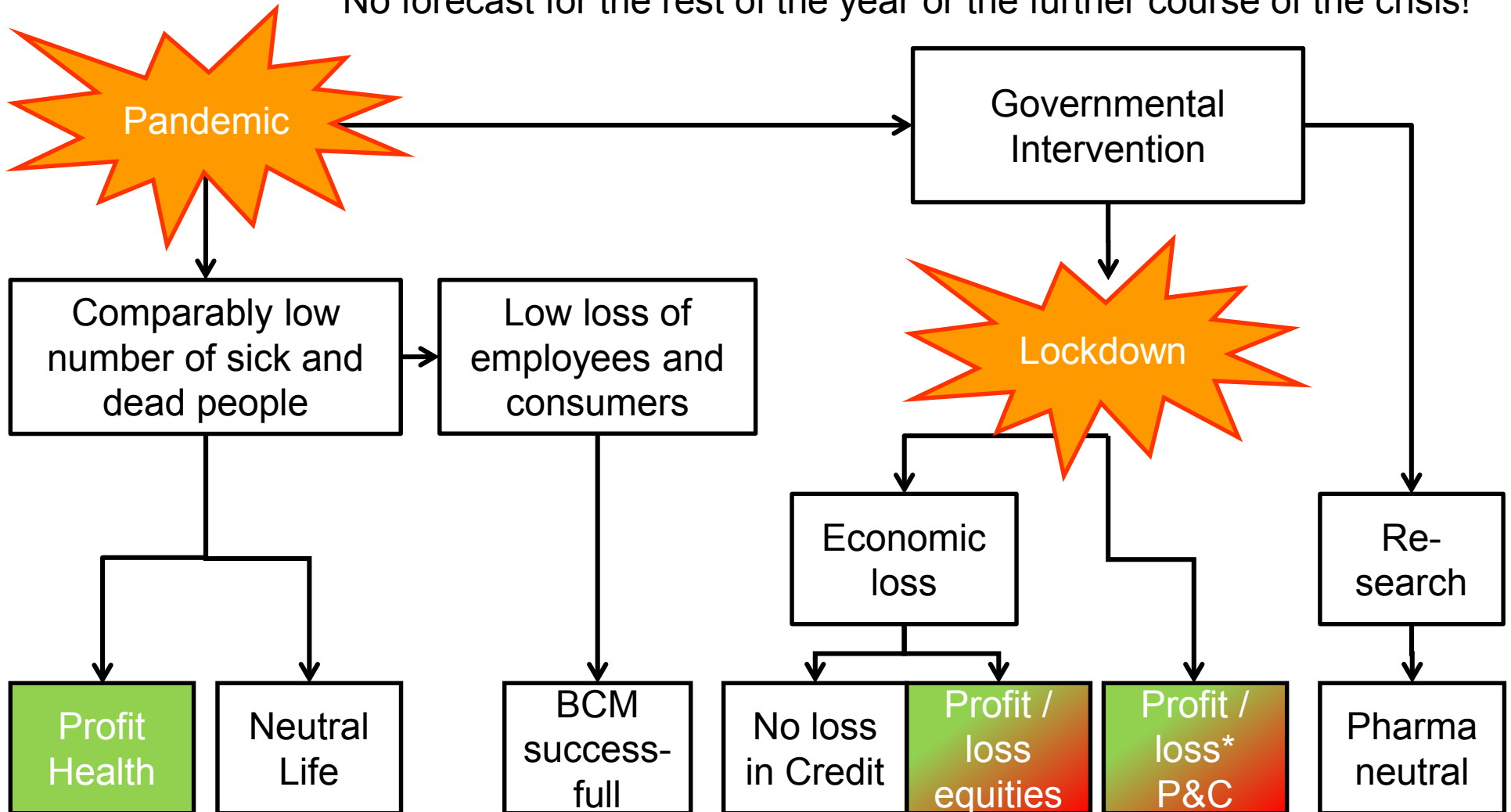
Dr. Frank Schiller
Vice Chair AAE RMC

Modelling Pandemics CERA Training 2011



Reality during COVID-19 crisis in 1st HY 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

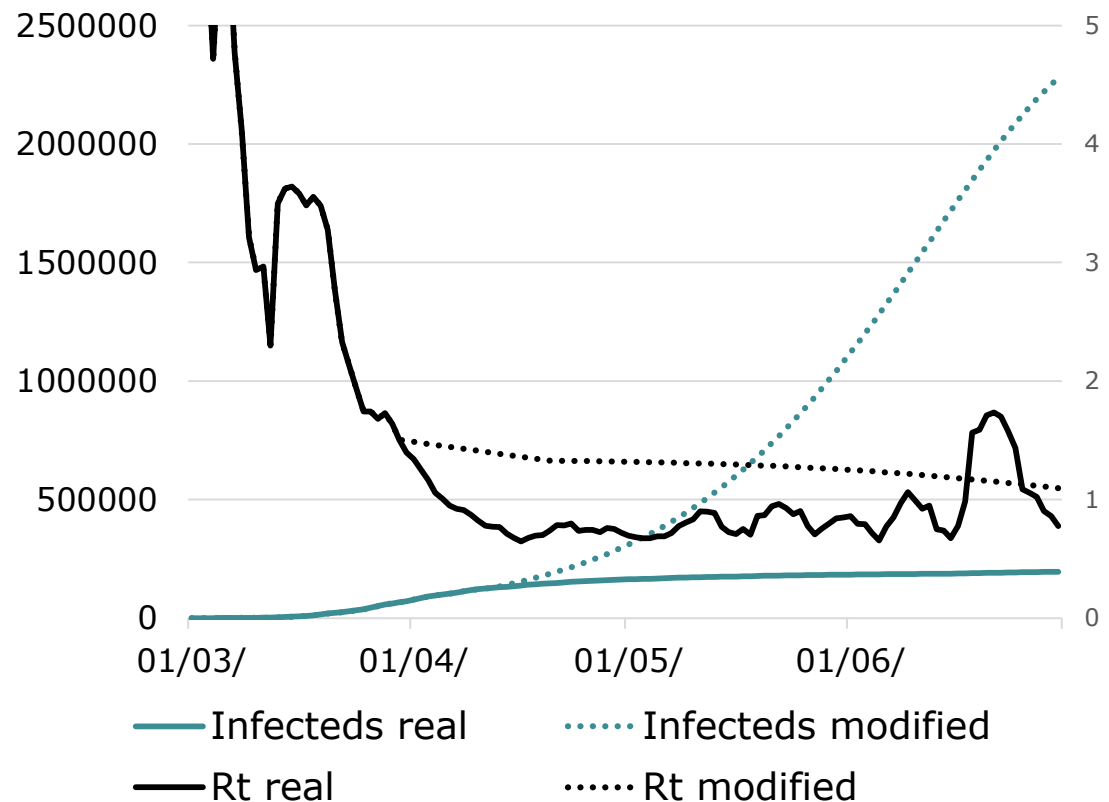
What makes a pandemic difficult to control

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 aggravated 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-fold from 6,933 to 44,142.

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



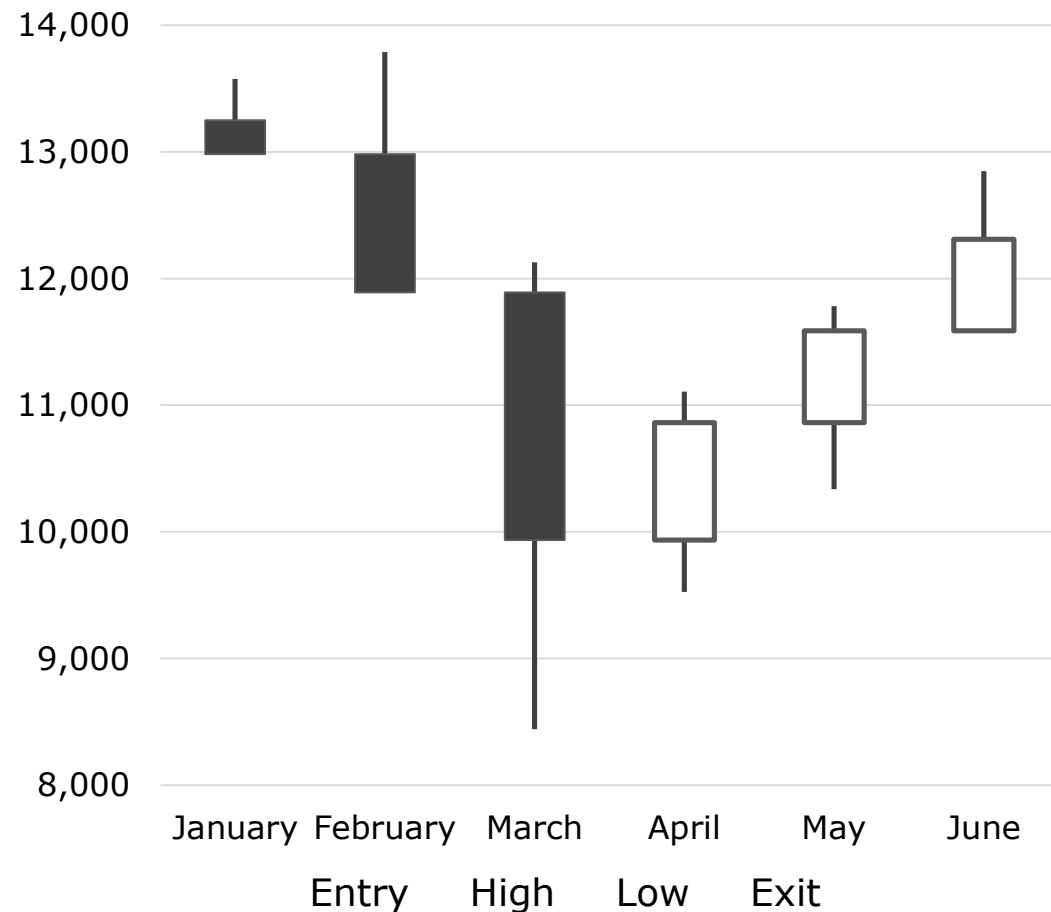
What makes a pandemic difficult to control

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 capital market.

The DAX fell by almost 39% from its high in February at 13,789 to a low in March at 8,442. In the meantime the share price has recovered.

DAX 1st HY 2020

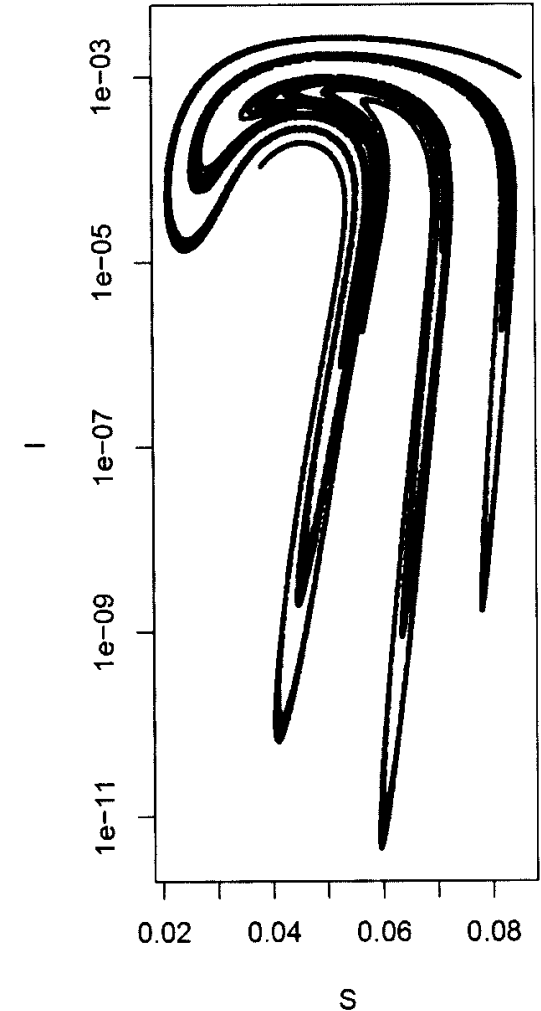
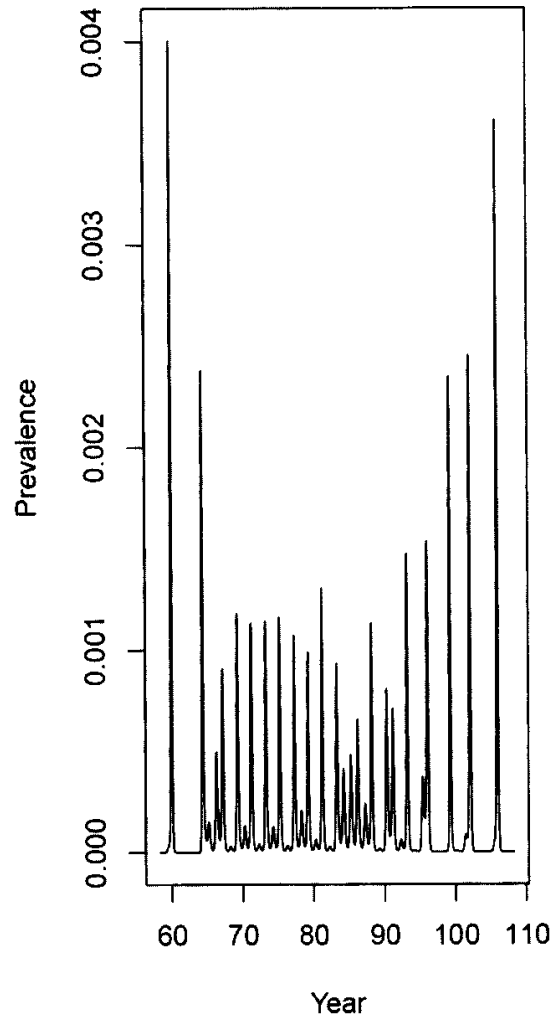


What makes a pandemic difficult to control

Even in (too) 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 forecast.

Pandemic is like the weather, only slower in development. Even with full clarity about the behaviour of governments and the capital market, it is still impossible to make a long-term forecast of a pandemic.



A Pandemic is VUCA

- **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)

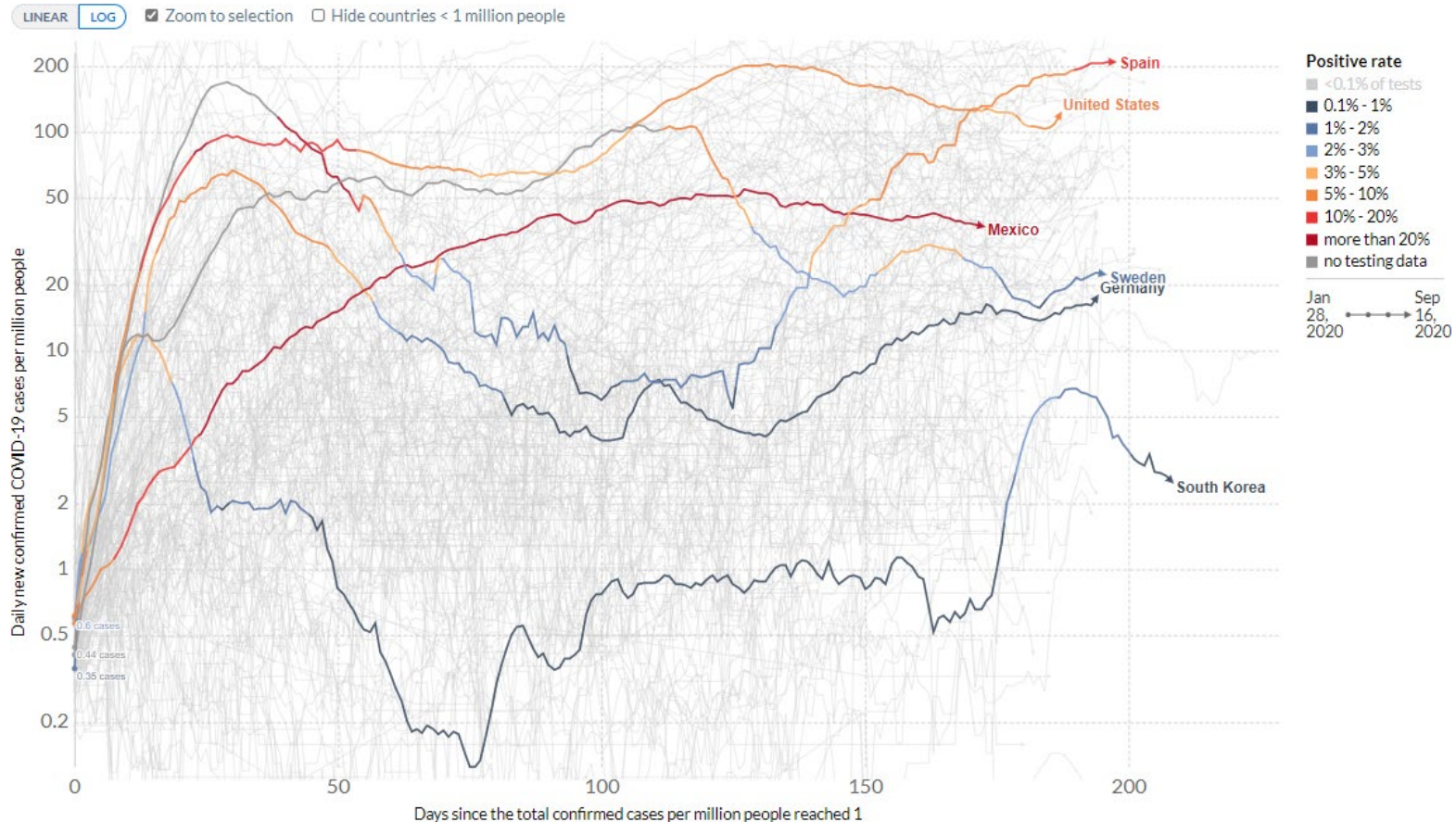
Five questions that remain unresolved:

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.



Source: European CDC - Situation Update Worldwide - Last updated 16 September, 17:05 (London time), Official data collated by Our World in Data

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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

With 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 an opportunity:

- **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

Any questions or remarks?

Dr. Frank Schiller
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