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IMPACT OF GLOBAL WARMING ON LIFE AND HEALTH

Christophe Heck, Market Head L&H France

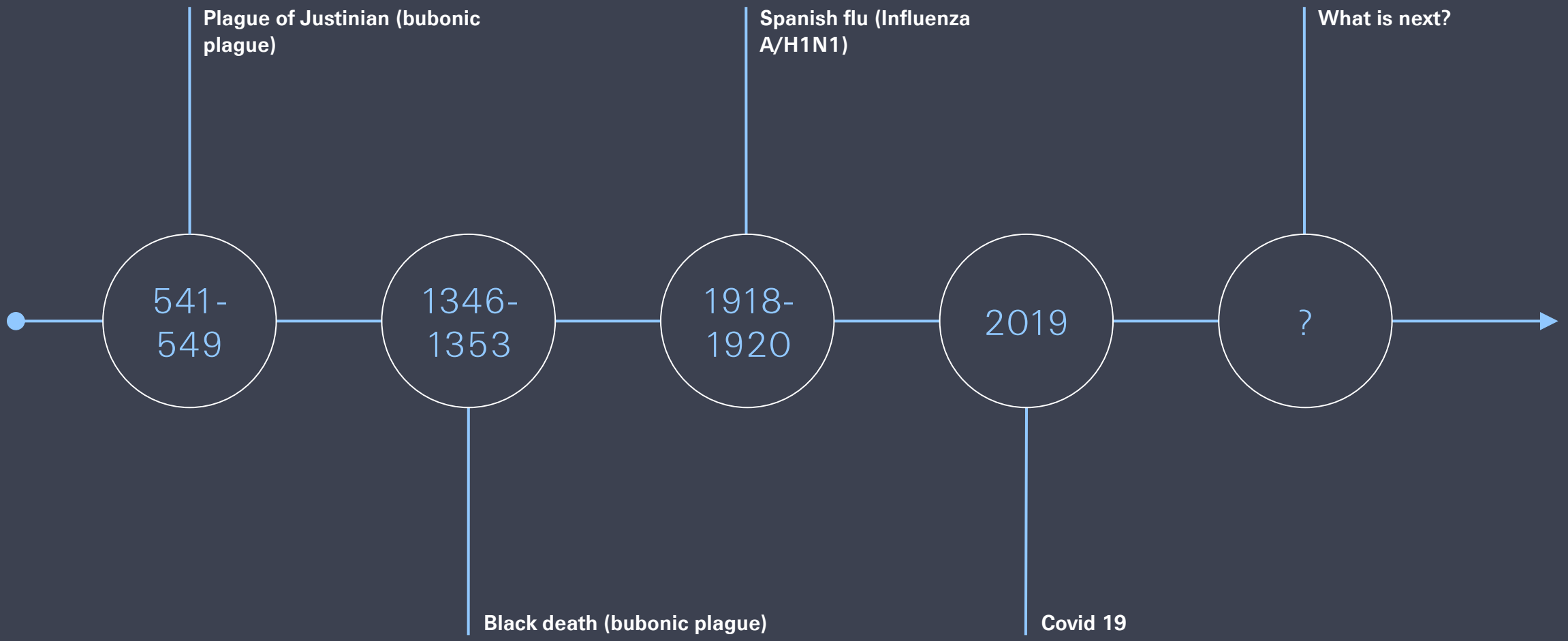
Those who cannot learn from history are doomed to repeat it

Sir Winston Churchill

The past

01

Pandemics of the past and of the future



What about less known pandemics – Encephalitis lethargica

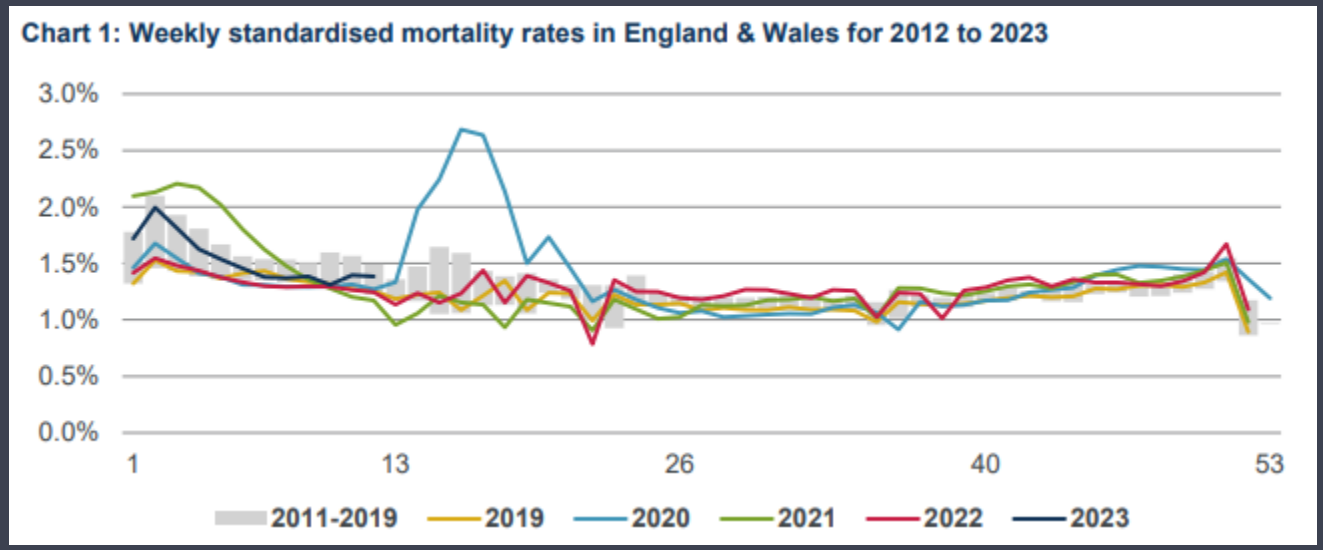
- **When:** 1915-1926 (1917 – Constantin Von Economo and Jean-René Cruchet)

- **Symptoms:** loss of speech, motion less, coma-like condition and the one who recovered never returned to pre-illness vigour

- **Consequences: m**ore than 500’000 deaths and one million people contracted the illness

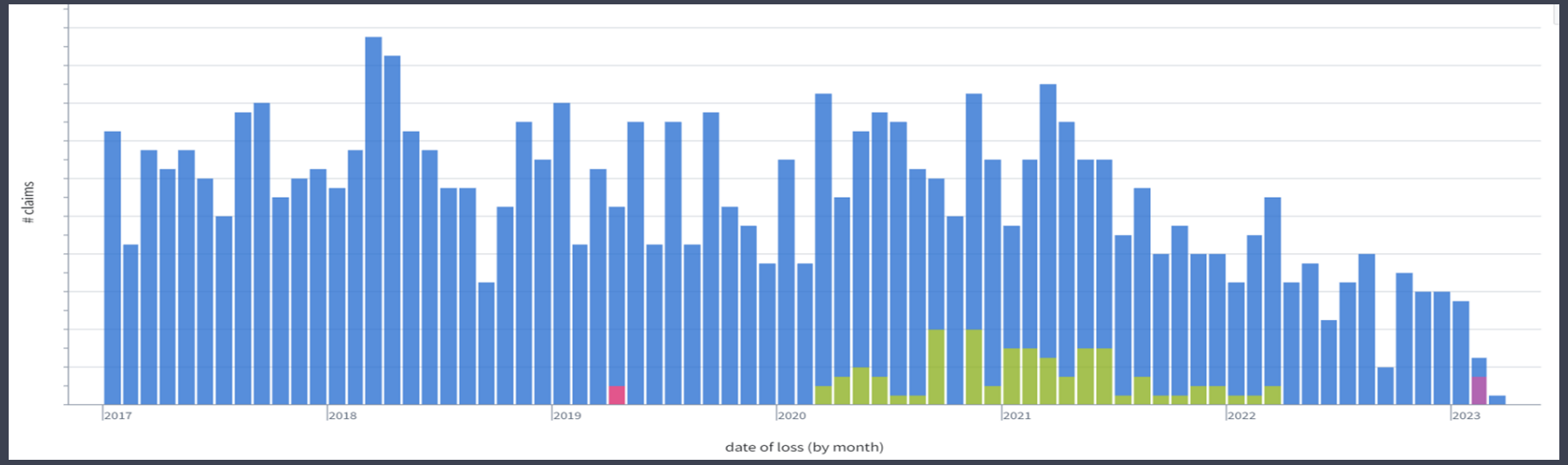
- **Why is it interesting:** used for modelling extreme events in health in Solvency II

Mortality in England & Wales – Important impact of Covid in 2020



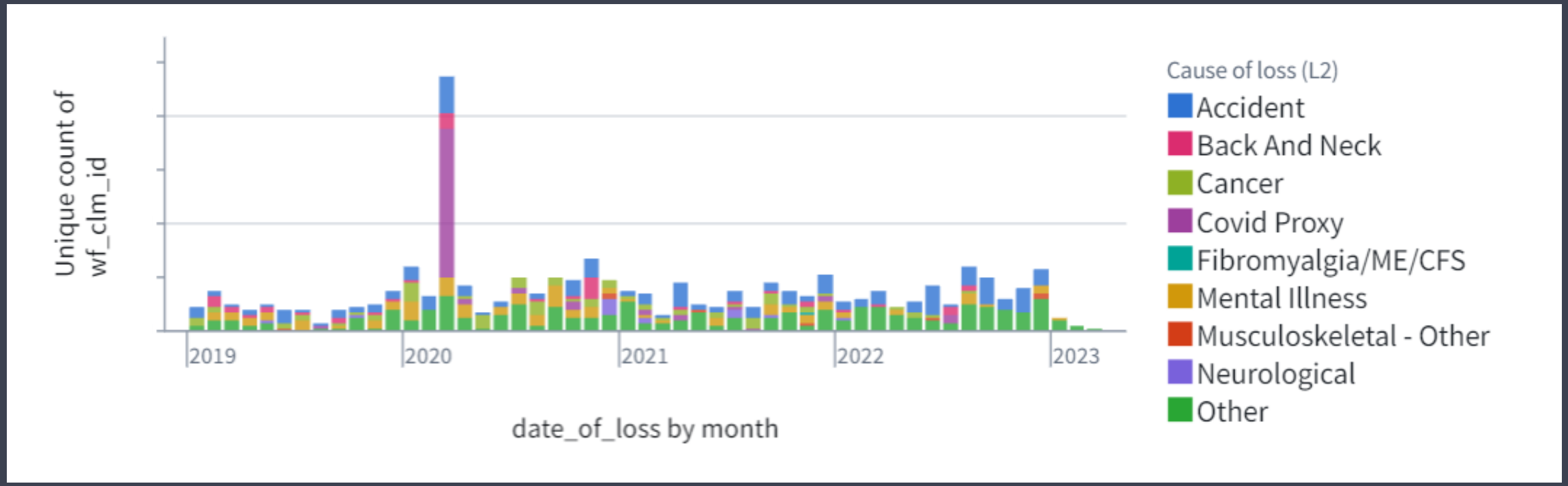
Source: www.actuaries.org.uk

Mortality in Continental Europe – Number of claims due to Covid (in green)



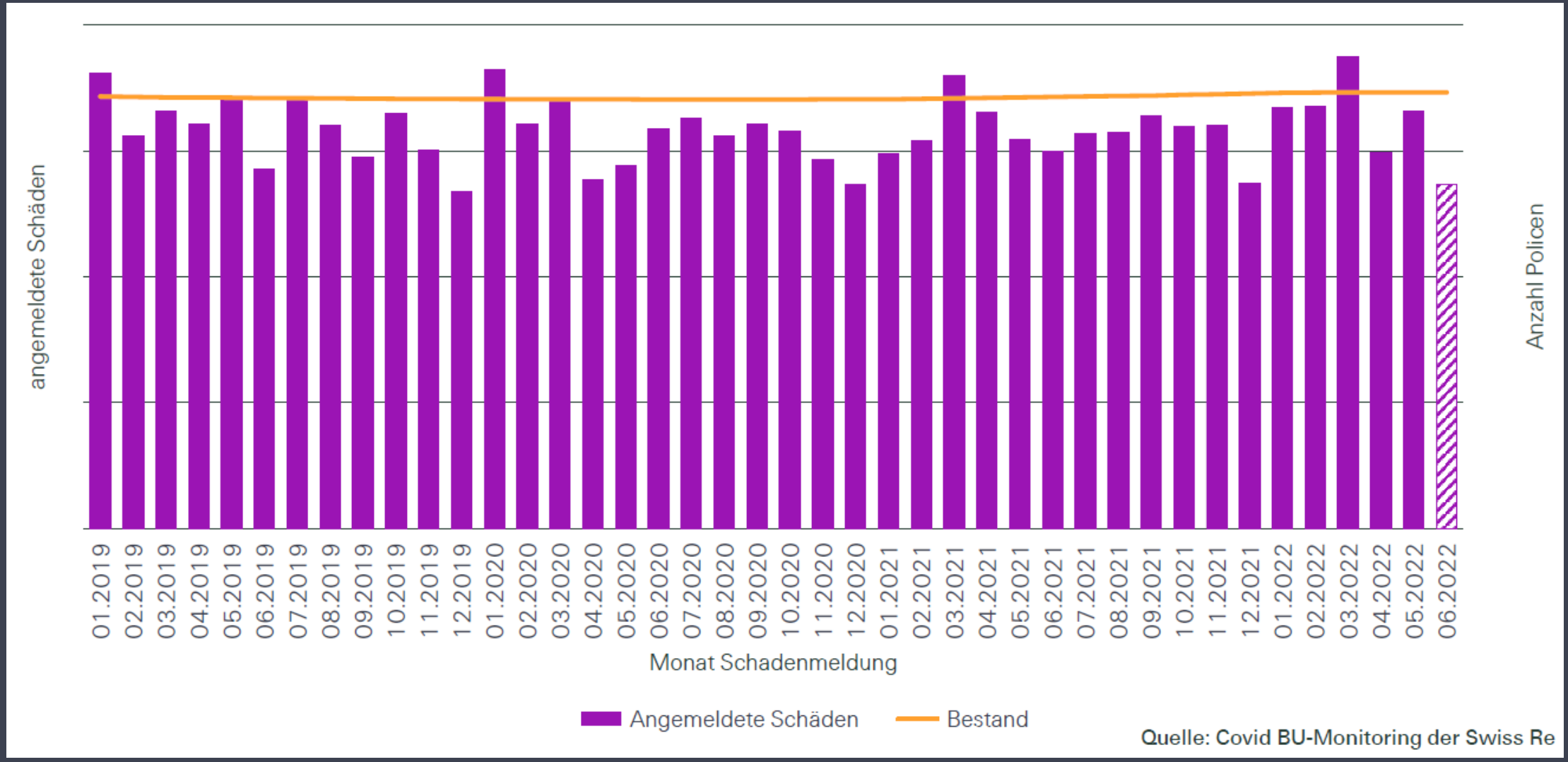
Source: Swiss Re's claims portfolio

Disability in France – Increase in number of claims due to Covid



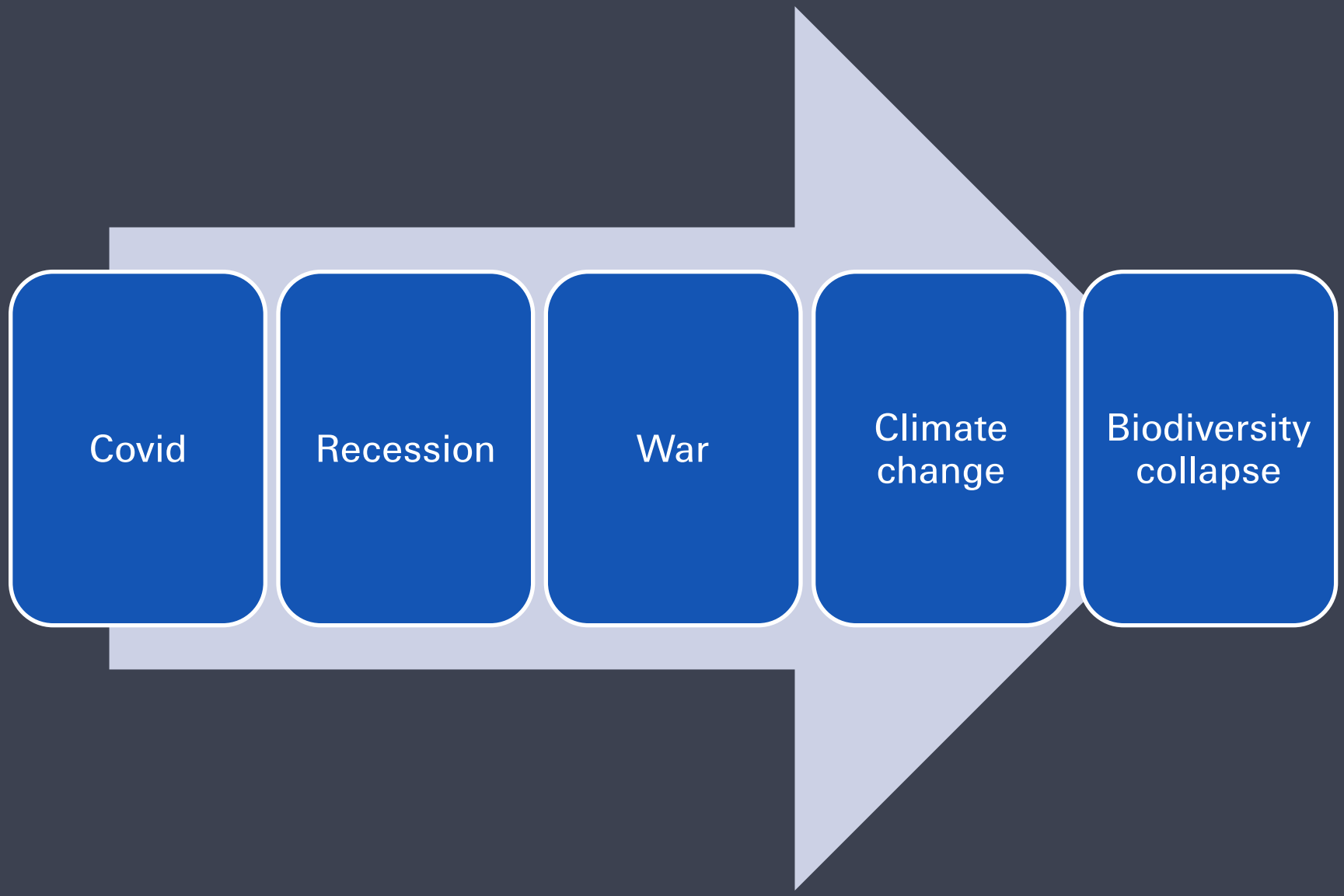
Source: Swiss Re's claims portfolio

Disability in Germany – Limited impact on number of claims due to Covid



Impact of a pandemic on (re)insurance companies depend on market specificities and the underlying insured population

Underwriting Strategy

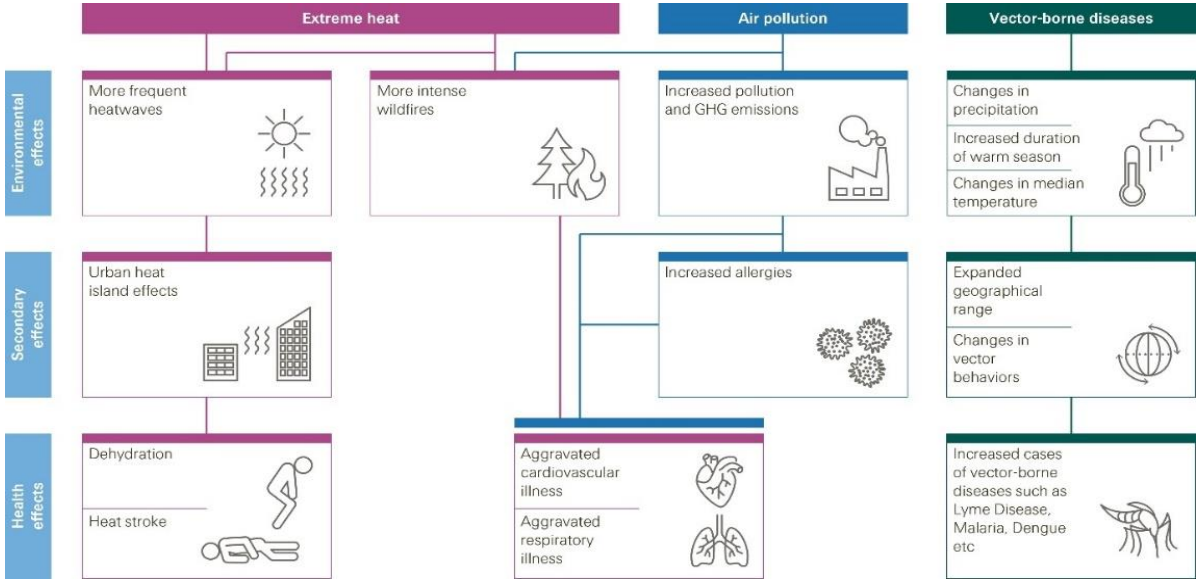

Covid
Recession
War
Climate change
Biodiversity collapse

What about the future?

02

L&H climate drivers differ from P&C – long-term health deterioration vs acute events

- **Extreme heat deaths to increase** under the baseline climate scenario, **offsets from cold-related deaths** expected
- **Air pollution deaths set to reduce** as policy changes improve air quality in many parts of the world, through reduced emissions
- Existing **vector-borne illnesses** likely to increase in frequency and geographical distribution to previously unaffected territories (e.g. Southern Europe)
- **Increased zoonotic diseases -** unknown threat level
- **Extreme weather** related injury **and mortality to increase –** low impact overall and experienced as shock events relative to extreme heat, air pollution and vector borne diseases
- **Second order effects** (water shortages, food insecurity, people displacement) could **intensify impact** of risk drivers



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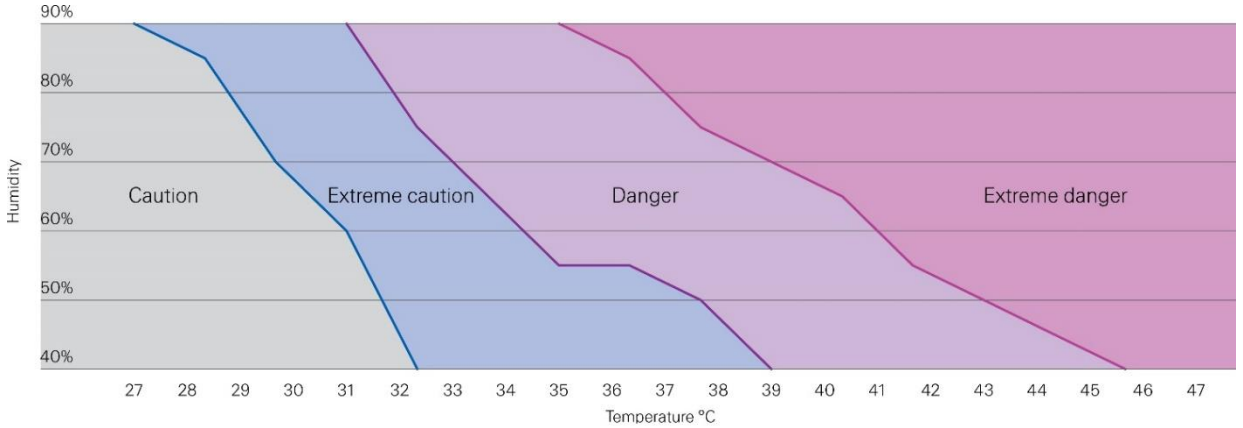
Extreme Heat

Extreme heat and the wet-bulb effect: the greater the humidity, the greater the risk to life

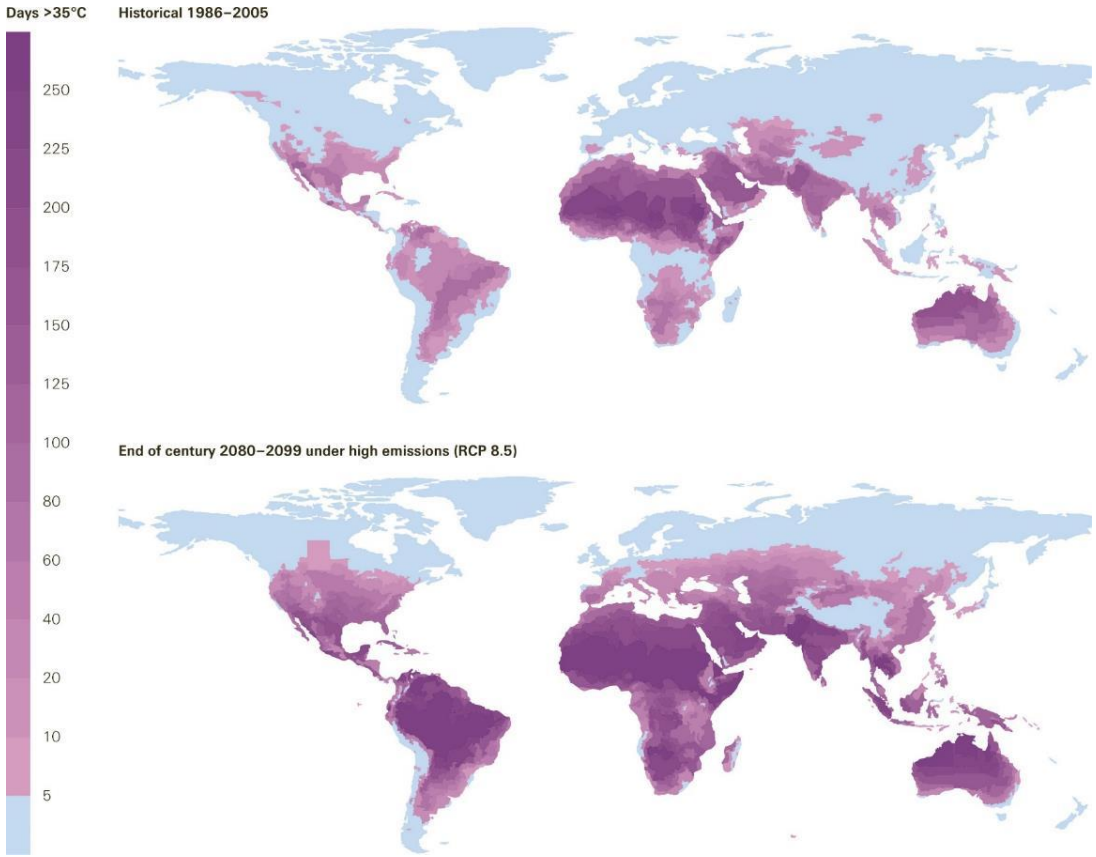
- NASA's Jet Propulsion Laboratory - highest wet-bulb temp. humans can tolerate is 35°C (at 100% humidity) for 6 hrs.
- Once this threshold has been exceeded, "no amount of sweating or other adaptive behavior is enough to lower your body to a safe temperature."
- Even a very healthy, young individual with unlimited drinking water and shade is at risk under these conditions.



Source: *Heat Index Chart*, United States National Weather Service (US NOAA), reproduced by Swiss Re Institute

Projected global increase of extreme heat days under a high emissions scenario

Compared to the historical scenario **from 1986-2005**, under a presumed high emissions climate (RCP 8.5), **by 2080-2099**, vast swathes of the globe are expected to experience **significantly greater days of extreme heat** (>35 degrees Celsius).



Source: Climate Impact Lab – reproduced by Swiss Re Institute

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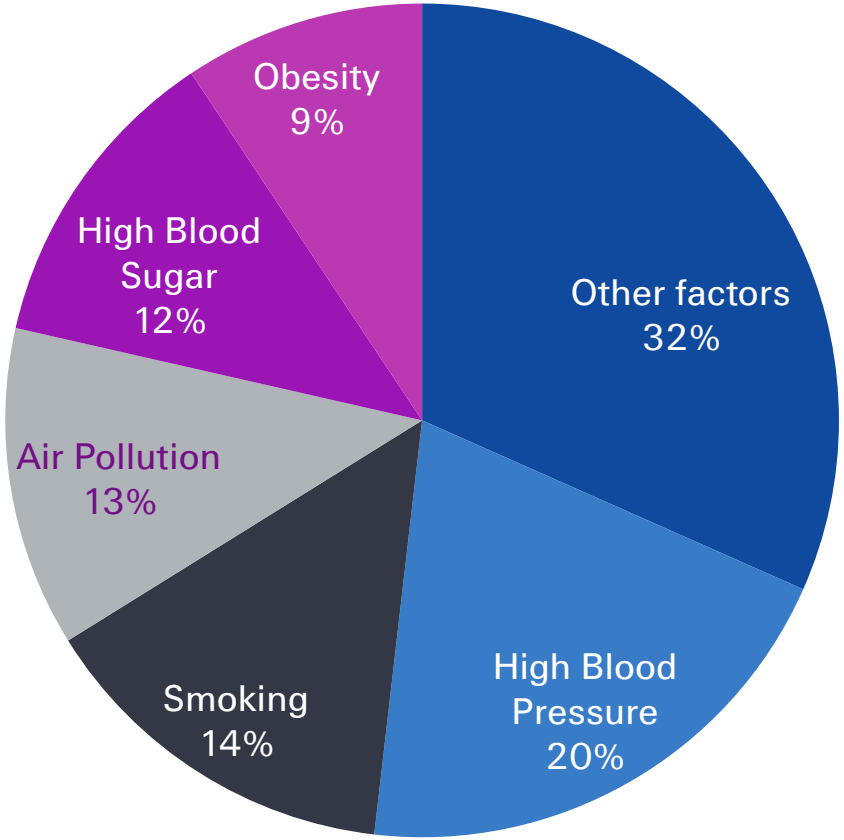
Air Pollution

Air pollution risk factors

- Estimated mortality worldwide: 4.5 million (2020)
- Estimated economic and health cost: $600 billion (US)
- 3rd key major risk factor globally, with outdoor air pollution ranked 5th (4.5 million) and indoor air pollution ranked 7th (2.3 million)
- Bigger impact for countries undergoing industrialization & transitioning from low to middle income
- Air pollution related death rates have fallen for almost all high-income countries (major body of Europe & North America) and a few middle-income countries (China, Brazil, etc.); and increased for low income countries.

Mortality projection by risk factors (2019 World data)

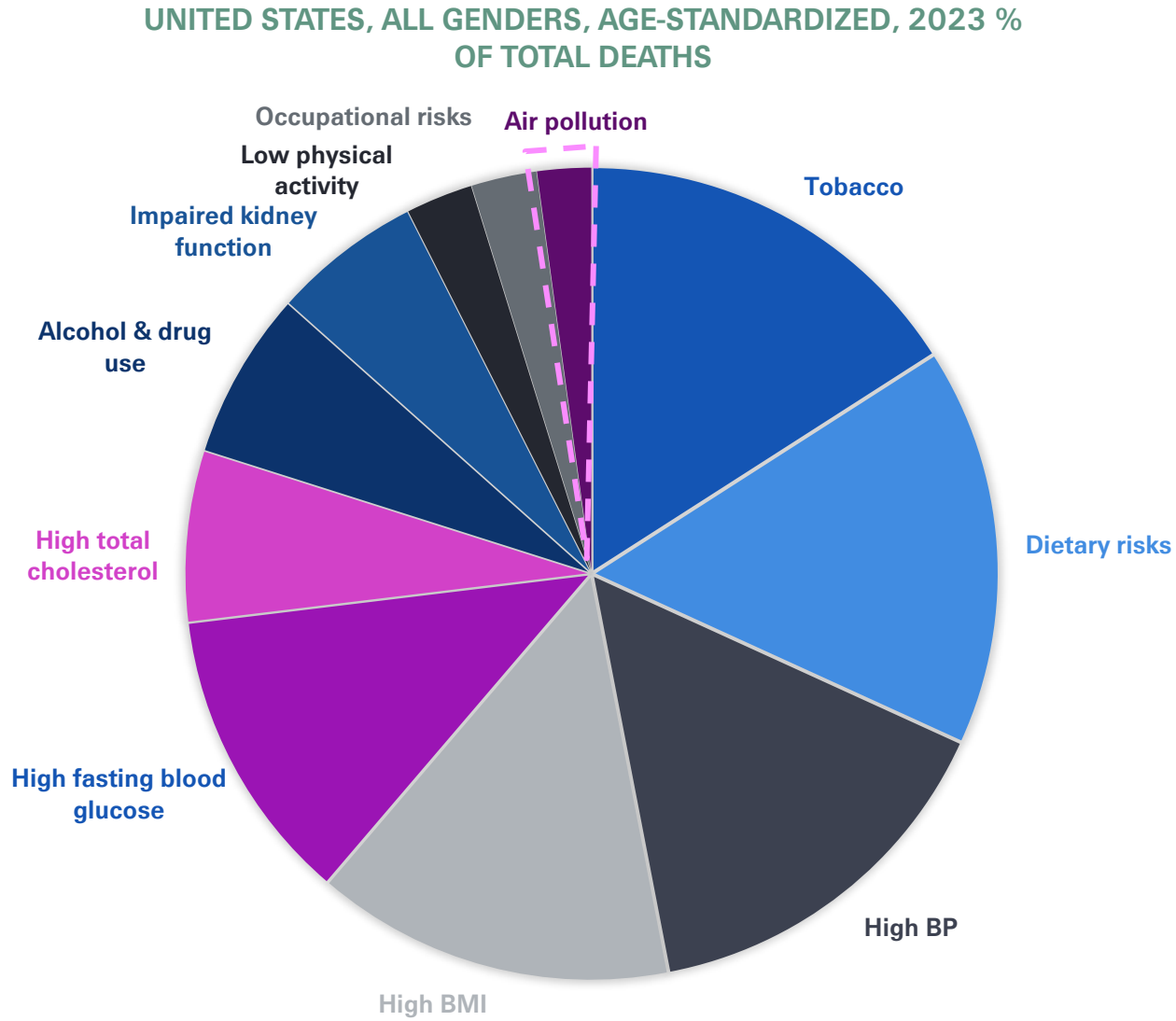


Source: The Lancet - Global burden of 87 risk factors in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. doi: https://doi.org/10.1016/S0140-6736(20)30752-2

Air pollution deaths as a proportion of total mortality in the USA in 2023

Total deaths predicted for 2023

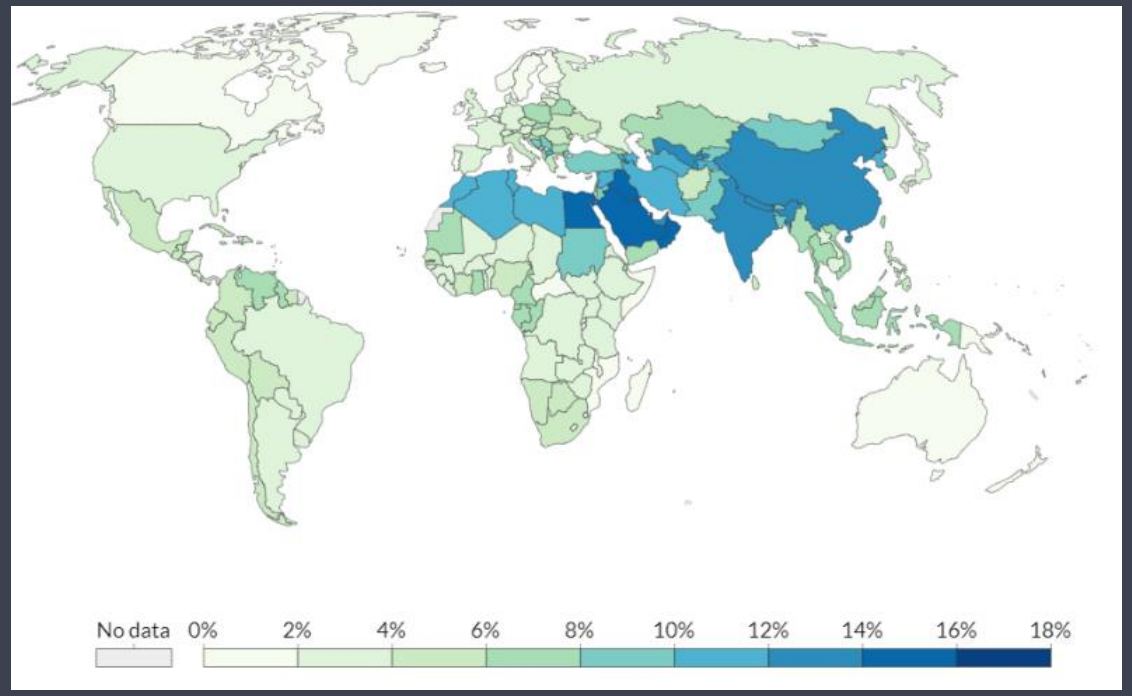
- Tobacco: 16%
- Dietary risks: 16%
- High blood pressure: 15%
- Low physical activity: 3%
- Air pollution 2%



Source: GBD Foresight VizHub - GBD Foresight Visualization (healthdata.org)

Worldwide air pollution mortality distribution

- The largest air pollution impacts are in developing countries. Under an ideal RCP 4.5 or lower scenario, air pollution is expected to improve and reduced deaths in high-income countries.



Source: Hannah Ritchie and Max Roser (2019) - "Outdoor Air Pollution". Published online at OurWorldInData.org. https://ourworldindata.org/outdoor-air-pollution

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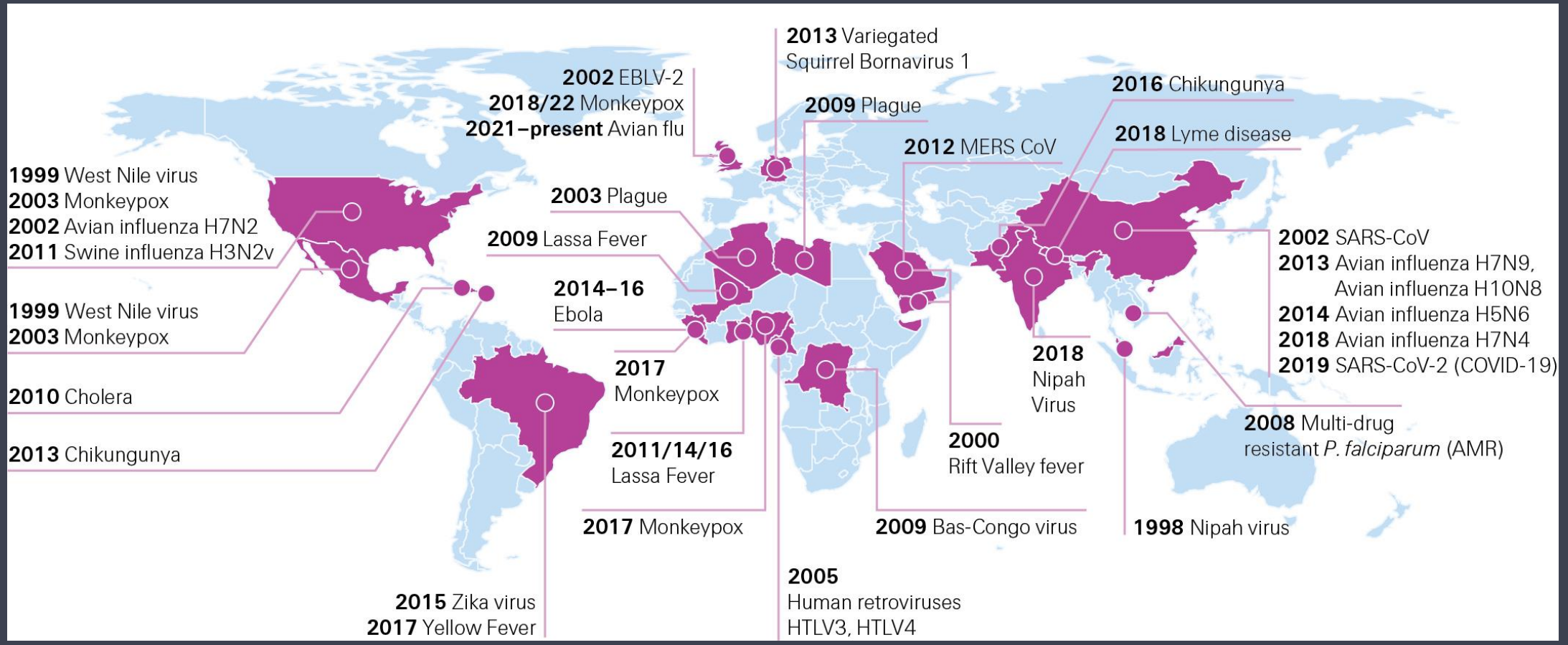
Vector-borne diseases

Global spread of new and significant emerging disease outbreaks since 1998



Source: Public Health England – reproduced by Swiss Re Institute

Impact on L&H insurers will depend on portfolio exposure to specific climate drivers and will vary significantly by geographic region and socioeconomic factors

Insured vs general population

- Typically more affluent groups are expected to have greater mitigation and climate adaptability, with resources to reduce exposure to the elements.
- Unknown factors such as vector-borne diseases are likely to be equalisers amongst the disparity.

L&H insurance rates

- Limited data on impact to health from climate change - thus far rarely listed as a primary or secondary cause of death.
- How climate factors interact with other key adverse health trends such as obesity, or ageing populations, remains concerning.
- Climate change impact best addressed along with other considerations on long term trends.

Financial reporting and disclosures

- Climate scenario analysis and stress testing now a regulatory priority for ORSA (Own Risk Solvency Assessment).
- High degree of uncertainty over long time periods maybe better suited to qualitative risk assessments.

Promoting health resilience

- Global action is necessary to build strong, climate-resilient societies.
- Public-private sector partnerships will be key to gather richer data to model the evolving climate, for better forecasting mortality/morbidity trends, and enable efficient and effective decision-making.

A holistic approach to climate change is required as it impacts (re)insurance companies not only on the asset side but also on the liability side

Life and Health (re)insurance companies are and will also be impacted by climate change

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