

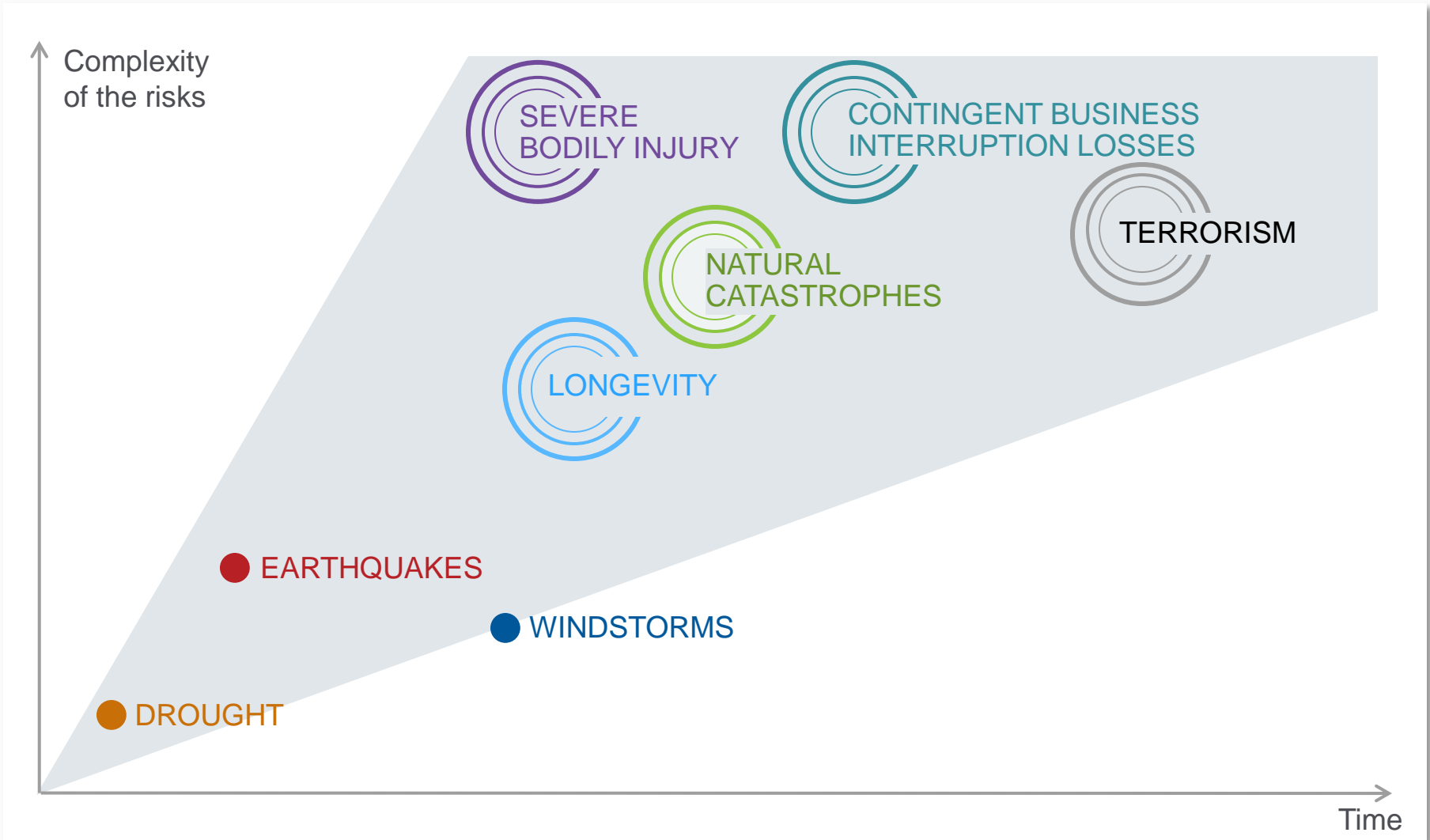


# COMPLEX ACCUMULATION RISKS – A CHALLENGE FOR THE INSURANCE INDUSTRY

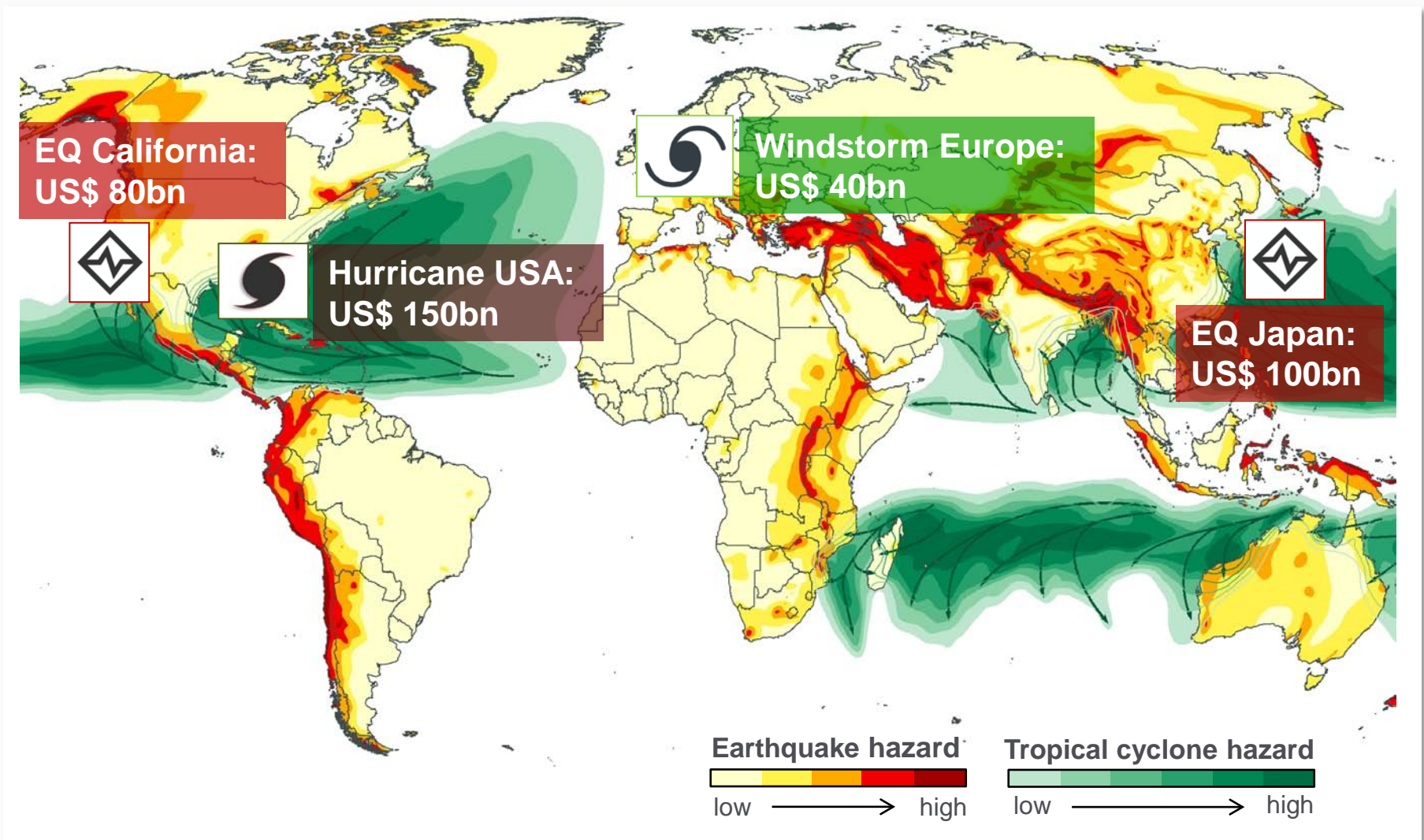
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# Accumulation risks are growing in complexity



# Insured market catastrophe loss potential (Scenarios)





# The prerequisites for insurability remain unchanged even for new kinds of risks

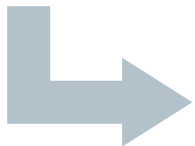
## Risks are only insurable if ...

... the potential losses are measurable

... losses occur randomly

... the (re)insurer has a large number of the same type of risk in its portfolio

**... they are independent of other risks**



**Risk independence is vital –  
this is how insurers avoid becoming systemically relevant**

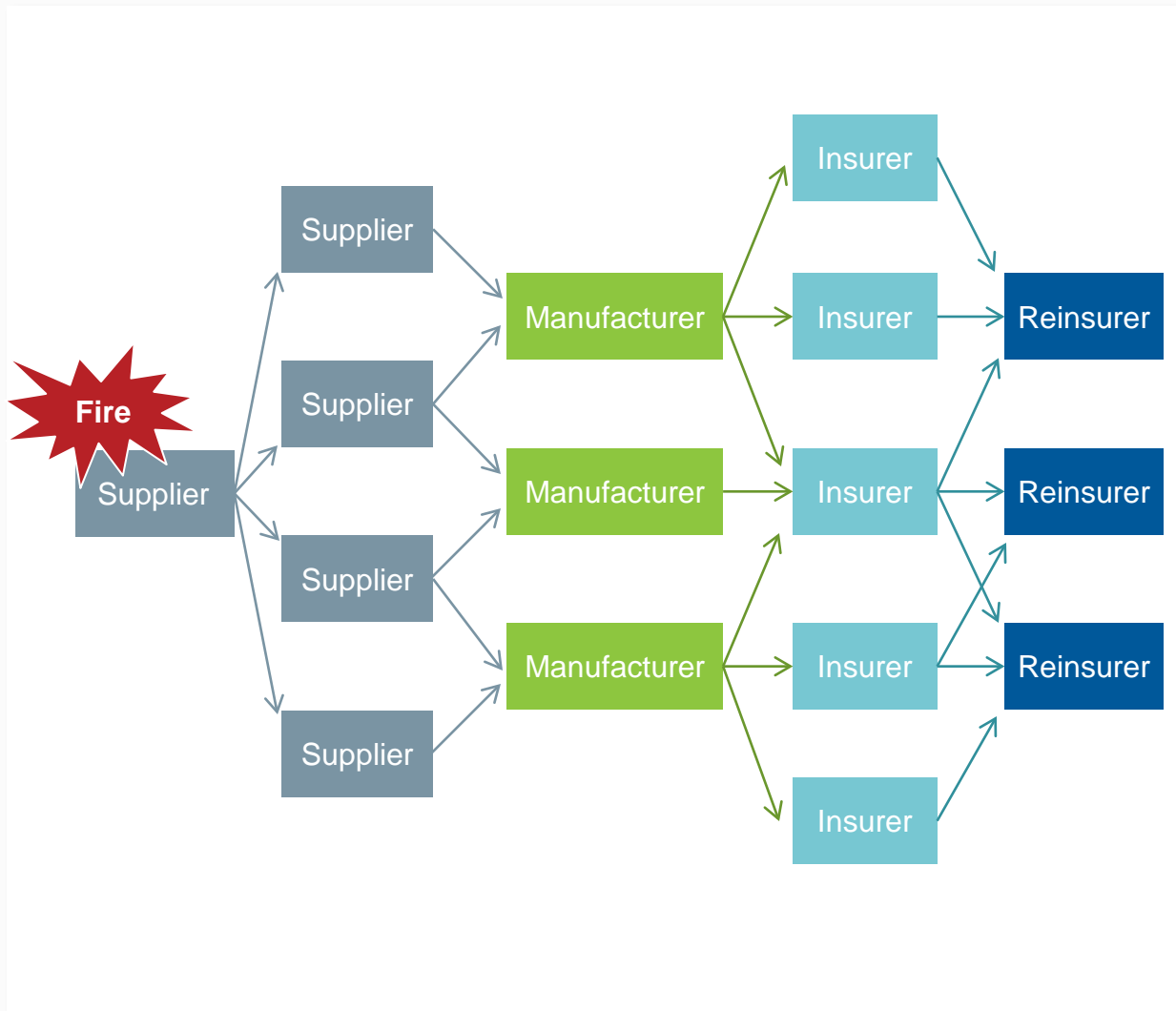
**Global trends increase the complexity and interdependency of risks**



## Challenges:

- Changing risks over time due to political/ social developments and the organisational capabilities of terrorist organisations
- No reliable frequency estimation (copycats, concerted actions)
- Conventional terrorism covered (pools, public private partnerships)
- Losses from attacks using chemical, biological or radioactive substances exceed the financial capacity of insurance → exclusion

# Accumulation risks II – Dealing with contingent business interruption (CBI)



## Challenges:

- Constantly changing economic relations create unknown risks
- Only limited CBI loss statistic available
- Uncontrollable nat cat exposure
- Insurers of CBI risks are covering a risk they can hardly quantify
- The reinsurer has the risk of accumulation from a variety of participations with different insurers from all over the world

Two systemic risk scenarios influence the severe bodily injury risk:

## Long-latency diseases

e.g. asbestosis

## Risk of change

e.g. claims inflation, legal changes

**The major focus is aimed at an increased alignment of interest between insurer and reinsurer**

### Measures:

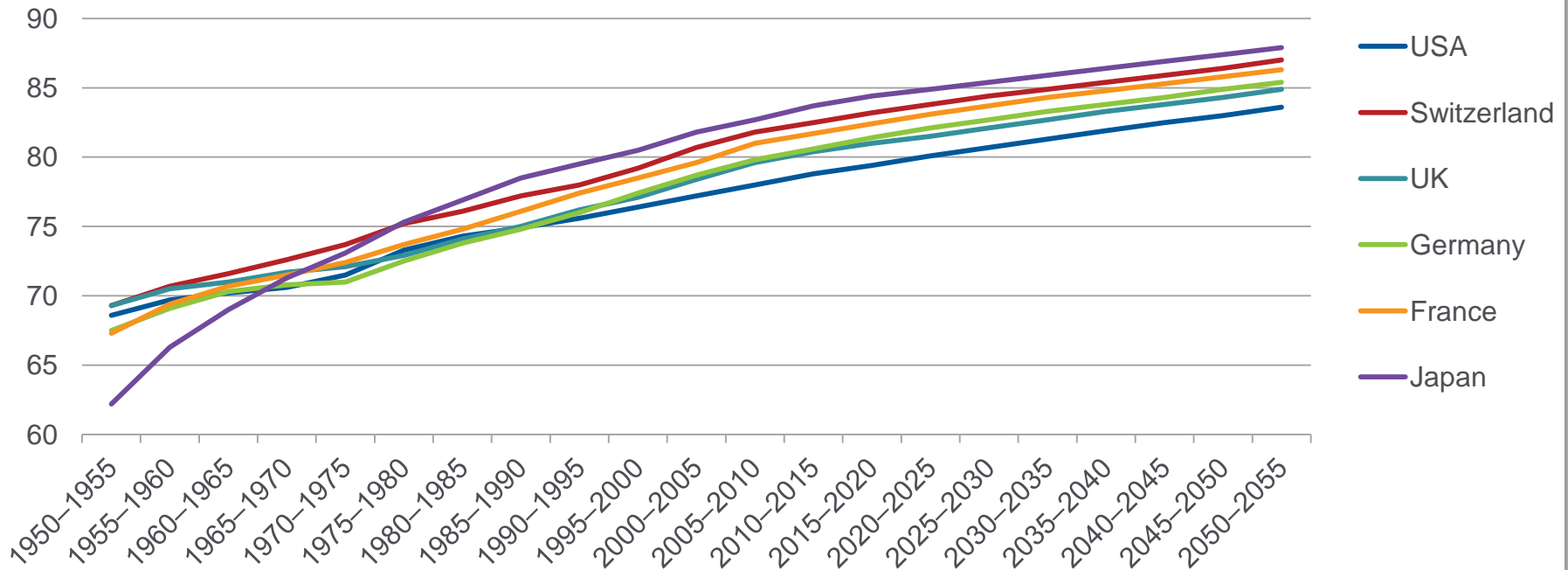
- Early identification of risk trends
- Adoption of the risk-sharing clause, i.e. one person is one event for the purpose of reinsurance

### Measures:

- Detailed analysis of claims inflation
- Adequate consideration of inflation drivers in the pricing
- Application of indices for stabilisation clauses representing the actual claims inflation
- Replicating asset portfolio



## Life expectancy at birth\*



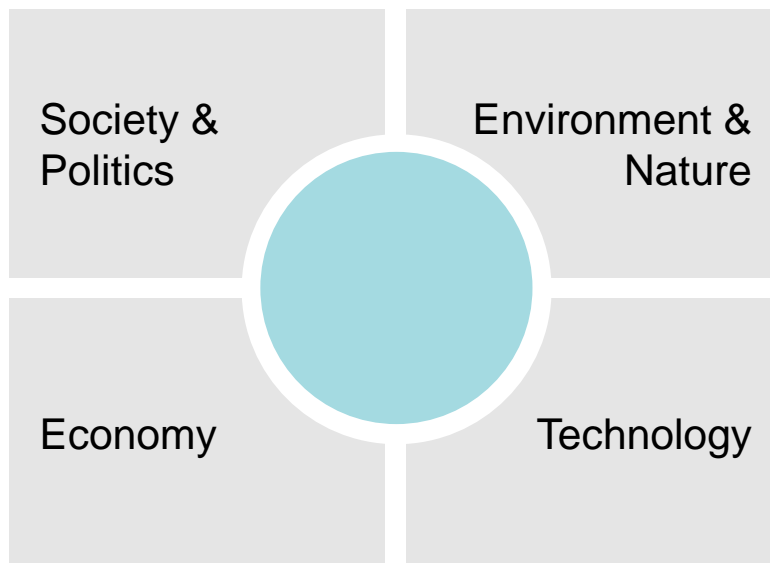
### Challenges:

- Life expectancy is increasing worldwide
- Historically, improvements in mortality have always been underestimated
- The longevity trend cannot be geographically diversified
- This is not a random development

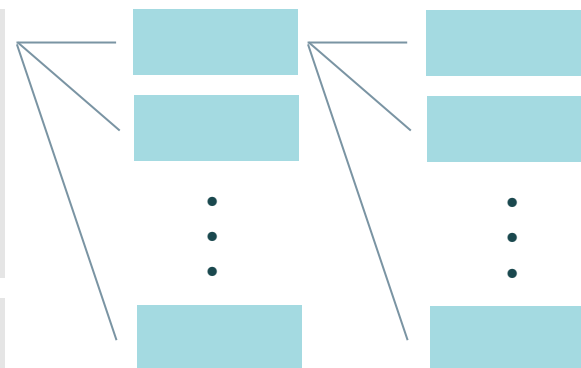
Munich Re has been developing a software tool for qualitative and quantitative analysis of complex accumulations

Complex Accumulation Risk Explorer (**CARE**) (Trial version for the time being)

Top Level Structure



Lower Levels

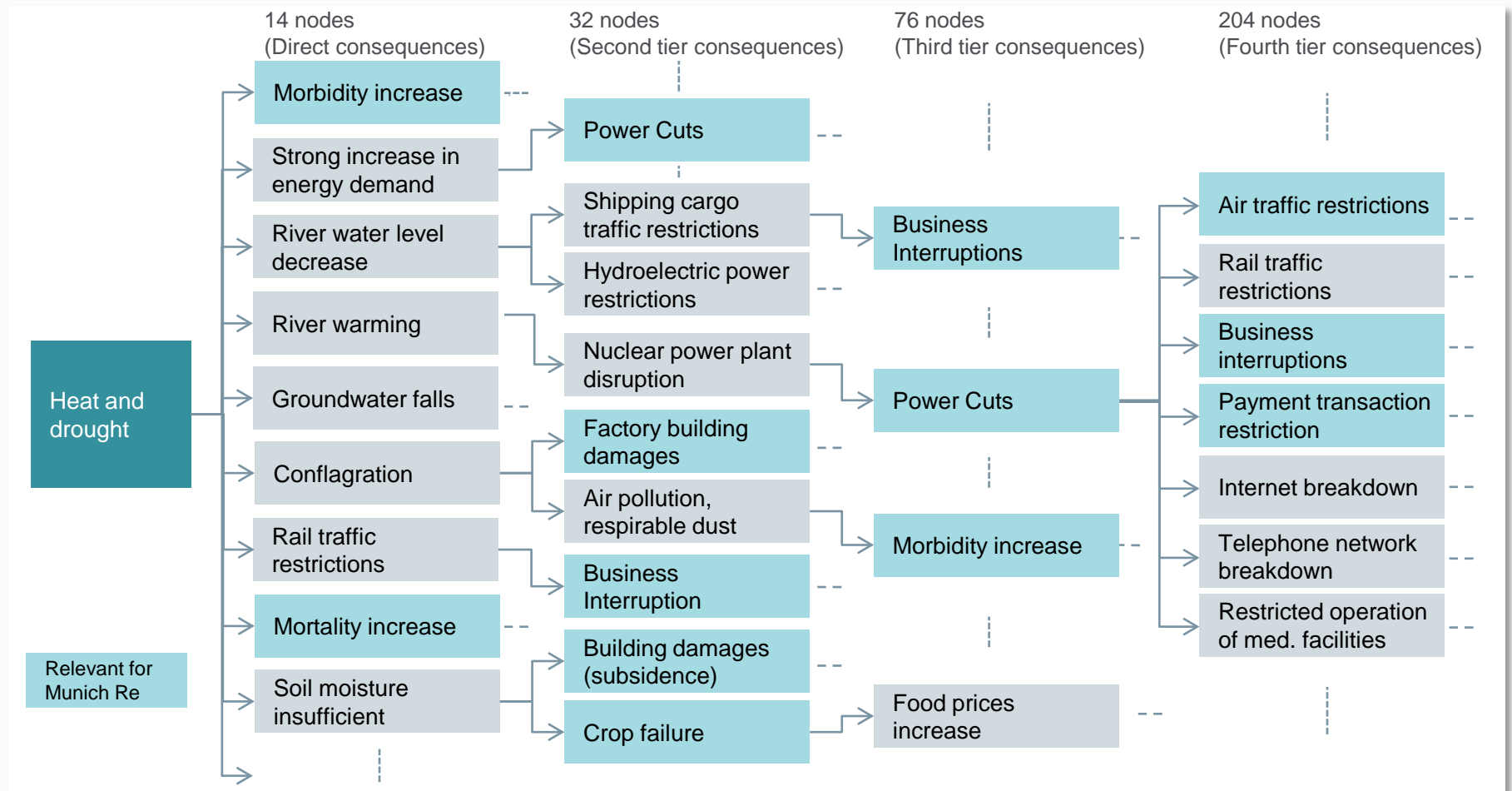


Interactions



**Target is the systematic identification of complex loss scenarios using interdisciplinary expert knowledge**

# Example: Potential consequences of a prolonged heat and drought period (selected nodes)



**CARE supports a structured discussion of accumulation scenarios**

# Complex risks require improvements to traditionally successful risk-management tools

Increased interconnectedness leads to an increasing complexity of risks

This complexity will have implications on diversification benefits

Transparency is a necessary condition for managing complex risks

Managing complex risks is a new challenge for the industry and requires a long-term commitment and active dialogue with external organisations

CARE will support identifying and structuring complex accumulation risks



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