Extreme Event Risks

2014 Update

Panel on Global Risks -- CAS InFocus Seminar

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TOWERS WATSON

The concept of extreme risks

Extreme events

- Very unlikely
- Significant impact should they happen
- Can be the tail of a spectrum, or binary events

- Define the boundary perimeter, from which one can work inwards

- Matter because we live in a single universe

- Assessment depends on our state of knowledge
- More frequent than we previously thought

How we see the world…

Finance

Economics

Politics

Society

Environment

Technology
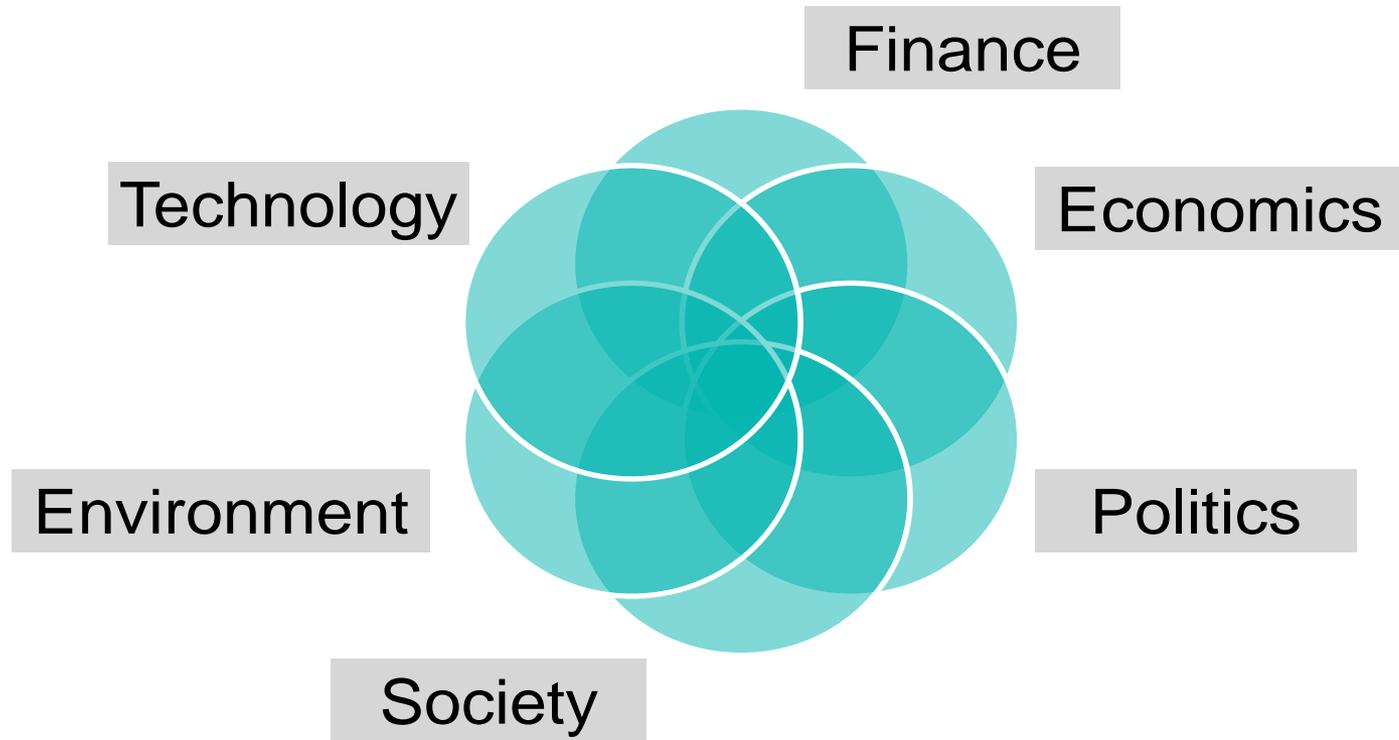
Extreme events are defined in three dimensions

Extreme Risk	Underlying Causes	Events	Impacts
Anarchy	Income inequality, perceptions of unfairness, dissatisfaction with government performance, populism, hyper-communication capabilities	Social disorder, rioting, attacks on governmental institutions	Government collapse, economic disruption and lay-offs, exit of foreign investment

Financial extreme risks

F1 Banking crisis
F2 Insurance crisis
F3 Sovereign default

Economic extreme risks

E1 Abandonment of fiat money
E2 Breakdown of capitalism
E3 Currency crisis
E4 Deflation
E5 Depression
E6 Hyperinflation
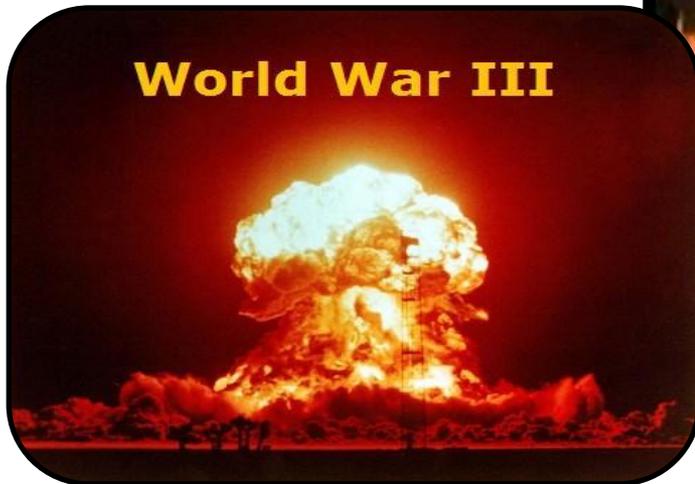**E7 Stagnation**

Political extreme risks

P1 Anarchy
P2 Global trade collapse
P3 Political extremism
P4 Terrorist attack
P5 World War III
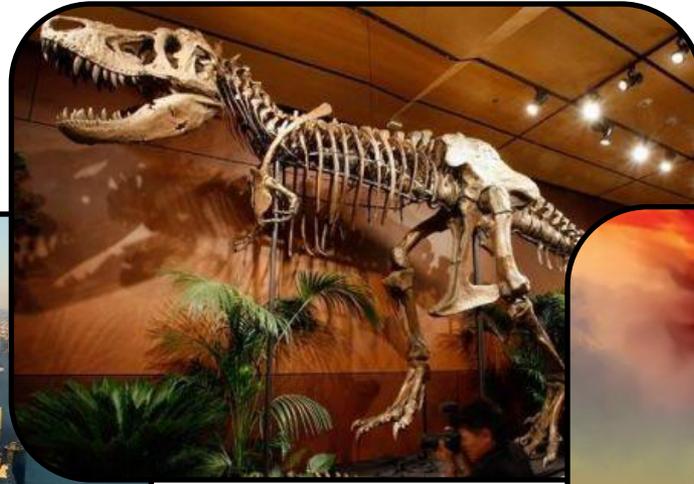
Environmental extreme risks
e1 Alien invasion
e2 Biodiversity collapse
e3 Cosmic threats
e4 Global temperature change
e5 Natural catastrophe

Social extreme risks

S1 Extreme longevity
S2 Food / water / energy crisis
S3 Health progress backfire
S4 organized crime
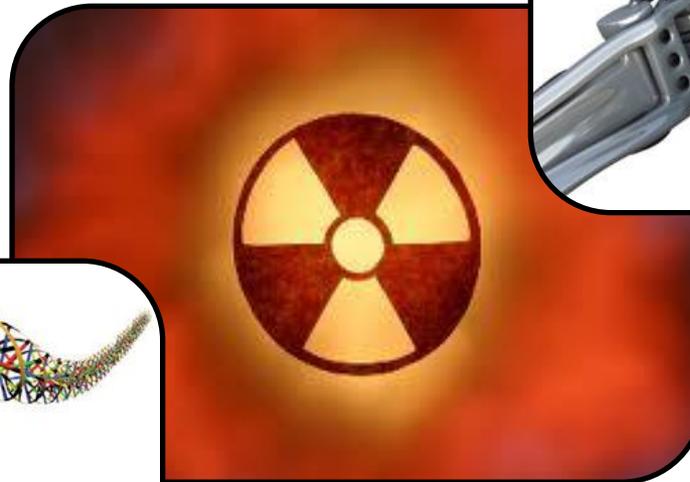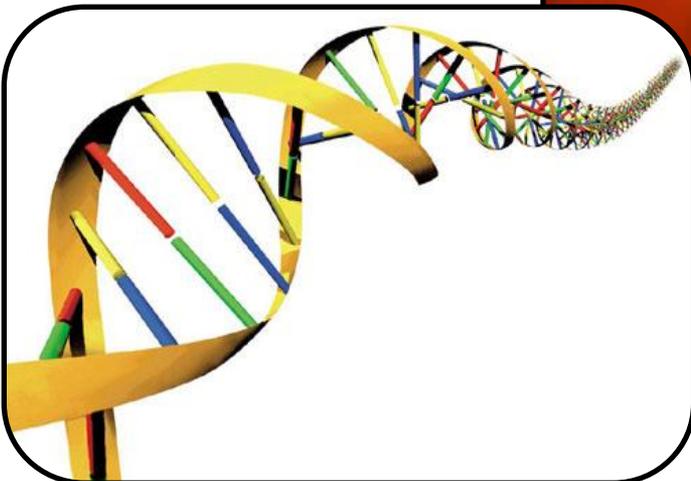**S5 Pandemic**

Technological extreme risks

T1 Biotech catastrophe
T2 Cyber warfare
T3 Infrastructure failure
T4 Nuclear contamination
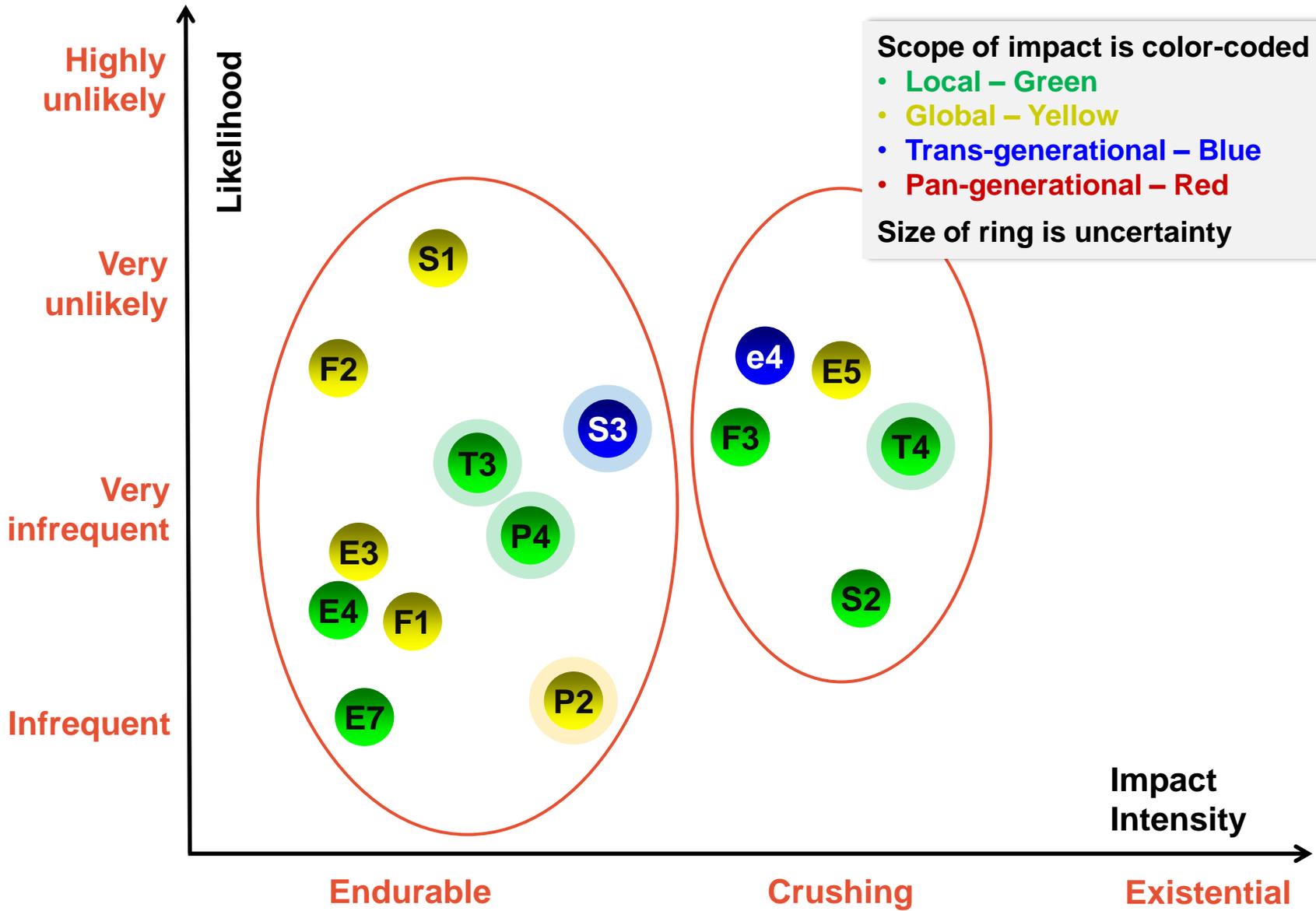**T5 Technological singularity**

After identification, the next step is risk assessment

- **Likelihood**
- **Impact**
  - **Intensity**
  - **Scope**
- **Uncertainty**

Prioritization

Towers Watson's priority ranking of extreme risks

(General, not specific to insurance industry)

Rank	Risk
1	S2 Food / water / energy crisis
2	E7 Stagnation
3	E4 Global temperature change
4	E5 Depression
5	P2 Global trade collapse
6	F1 Banking crisis
7	F3 Sovereign default
8	E3 Currency crisis
9	E4 Deflation
10	S3 Health progress backfire
11	T4 Nuclear contamination
12	S1 Extreme longevity
13	F2 Insurance crisis
14	P4 Terrorism
15	T3 Infrastructure failure

Implications of our top five risks

Rank	Risk	Implications for insurers
1	Food / water / energy crisis	Some potential impact on morbidity and mortality; investment winners and losers in affected goods and their substitutes; otherwise little impact
2	Stagnation	Poor investment returns for sustained period; rise in fraudulent claims; rise in bond defaults; otherwise little impact
3	Global temperature change	Some areas become less habitable, others become more habitable, leading to significant migration, with commensurate shifts in property values
4	Depression	High unemployment increases utilization of disability benefits; rise in fraudulent claims; rise in bond defaults; equities decline
5	Global trade collapse	Little impact on insurers, beyond investment losses from multinationals; imposition of excise taxes could impede global reinsurance activity

Wiki surveys are…

- **An attempt to escape traditional constraints**
- **A way to source insight from the 'crowd'**
- **Easy to use**
- **Based on research (M. Salganik, Princeton)**
- **Open source**

In the survey, we asked one question…

Over the long term, which is the biggest extreme risk for the insurance industry?

A

B

Submit your own idea…

Survey statistics

|	
Overall number of votes	**30,258**
Number of total ideas	**57**
Number of user-submitted ideas	**28**
Hours of participant engagement	**81**
Days survey was open	**55**
Average response time (of each vote in seconds)	**9.5**
Number of unique IP addresses	**565**

Notes:
- Not all user-submitted ideas were released due to overlaps
- Most firms will have a single IP address and so the number of participants will be a multiple of this figure

World map of votes
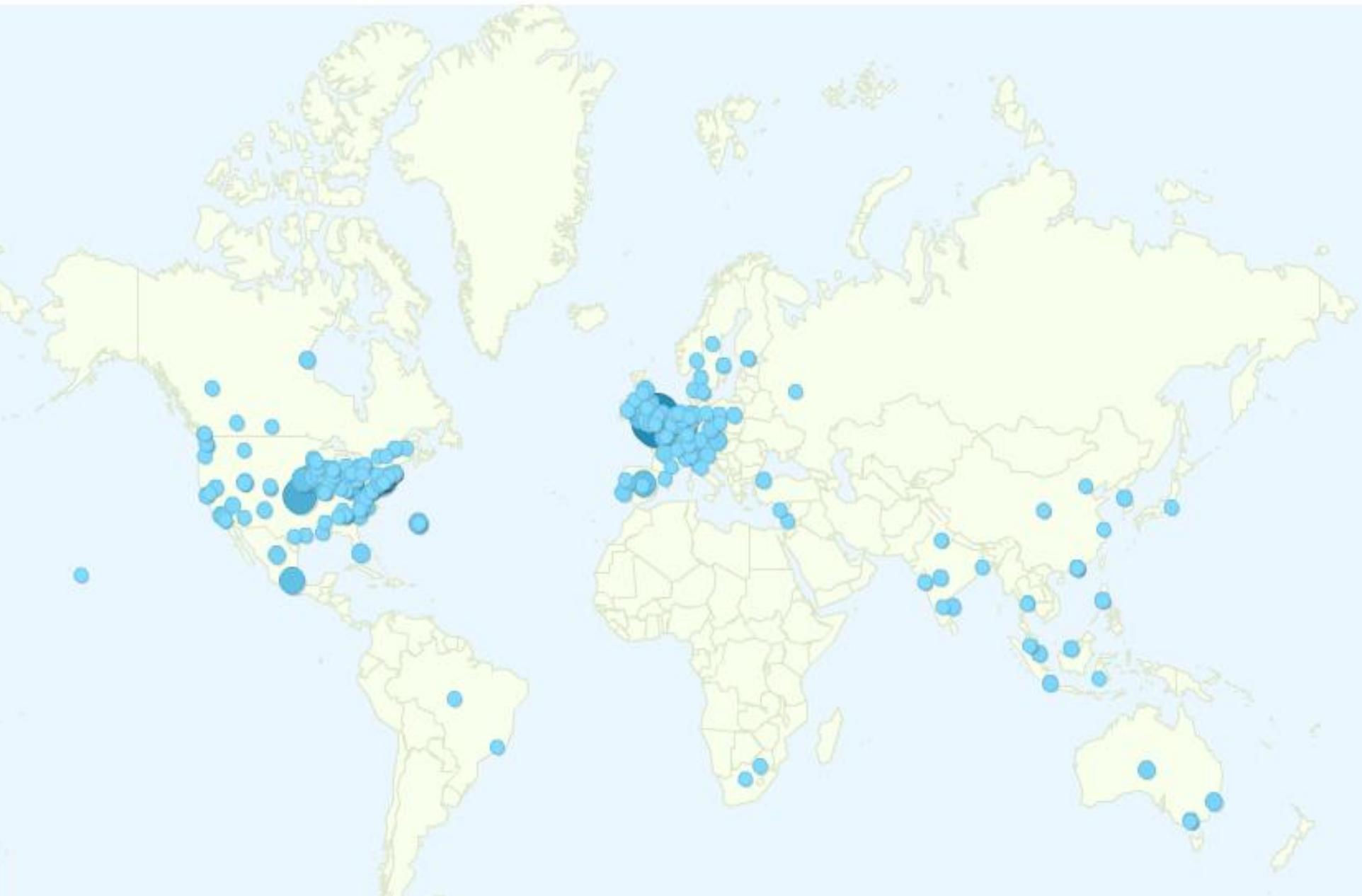
Top ranked ideas from wiki survey
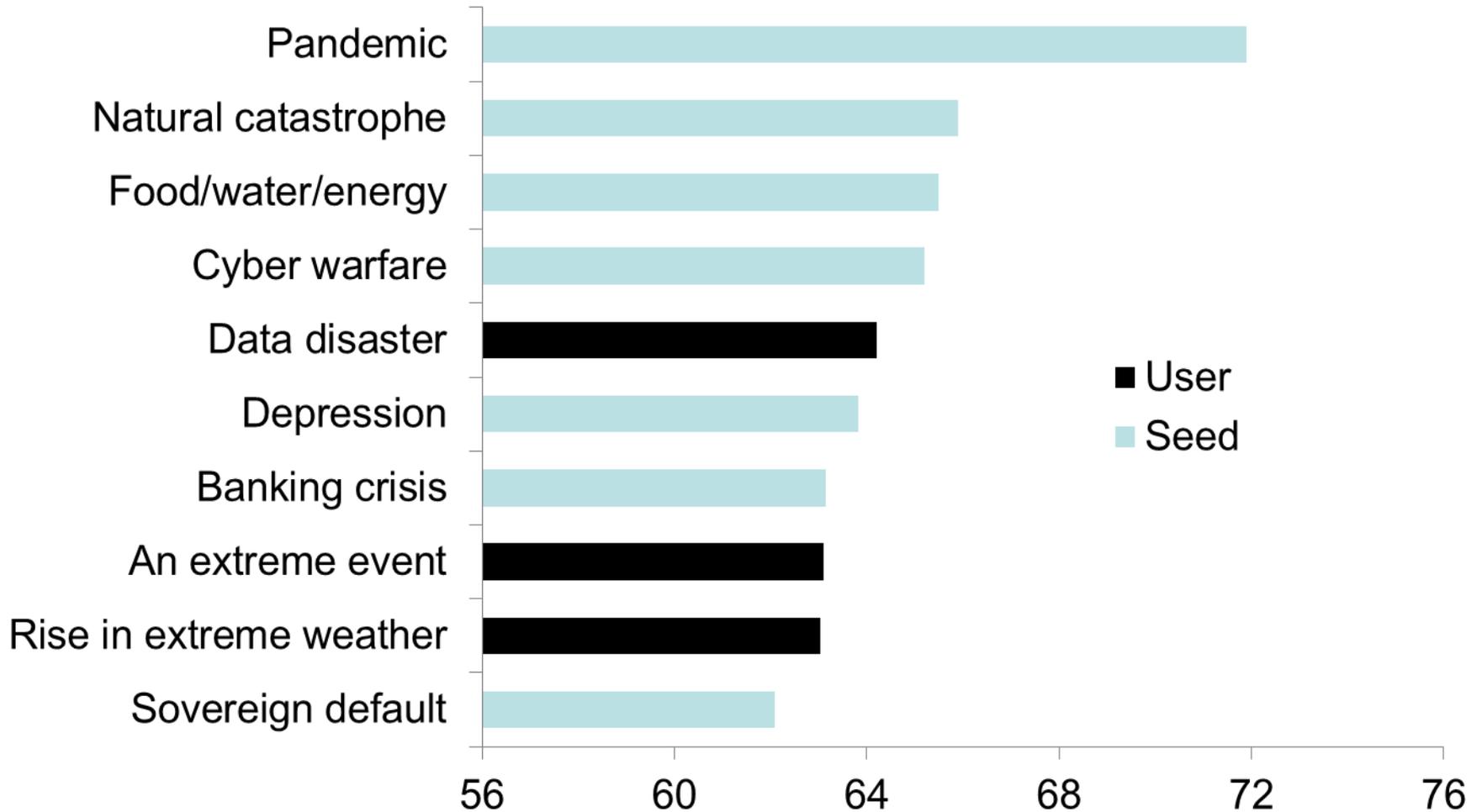
Survey versus Towers Watson
Greatest disparities in ranking

Seed idea	Survey rank	TW rank	Our view
Pandemic	1	17	Bad, but uncertain
Natural catastrophe	2	26	We are deeper into the tail
Cyber warfare	4	21	Very uncertain; inconvenient?
Hyperinflation	7	25	Unlikely; local; no one dies
Stagnation	19	2	'So what' for insurers
Temperature change	18	3	We should talk…
Global trade collapse	17	5	'So what' for insurers
Deflation	22	9	'So what' for insurers