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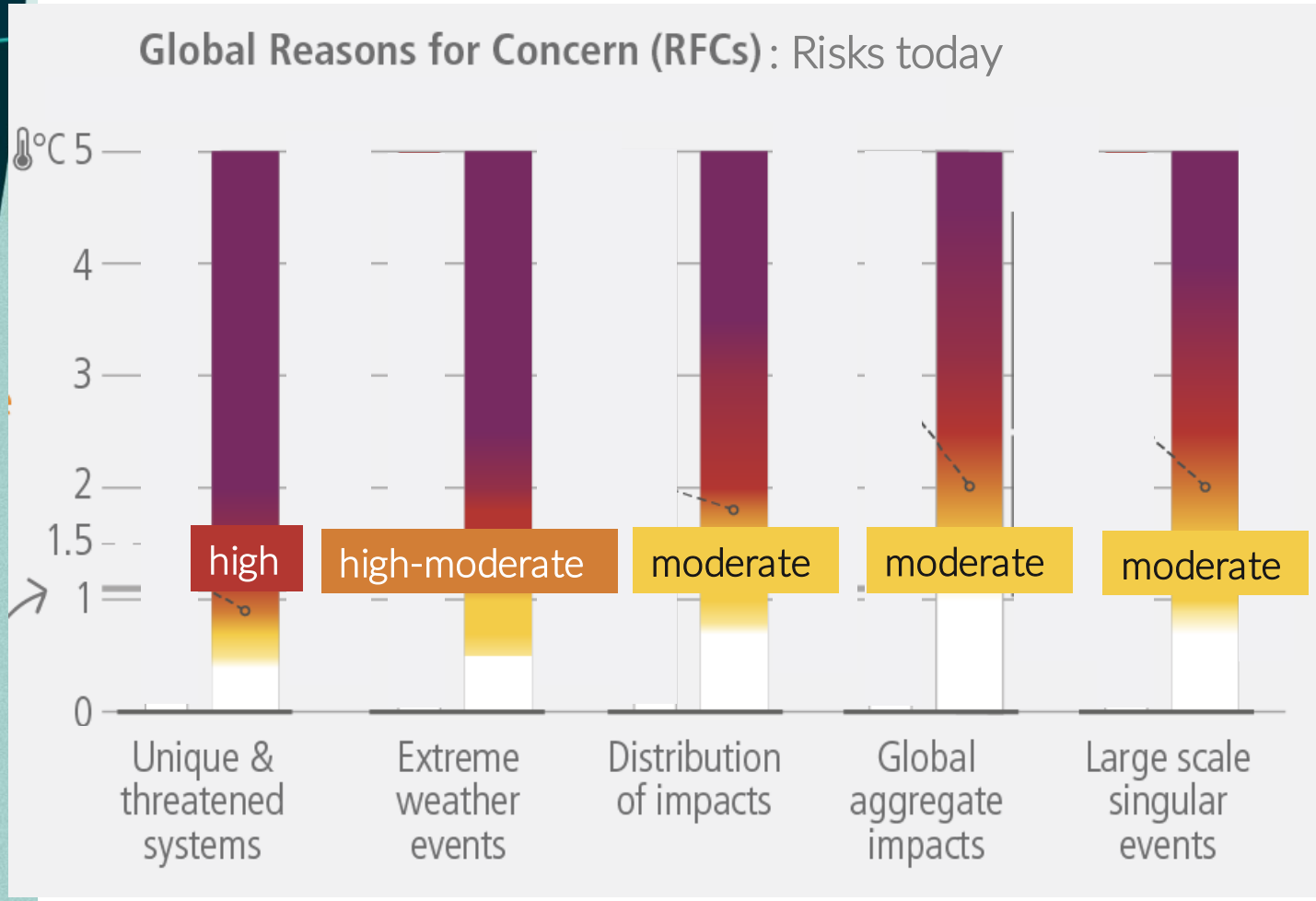
Quantifying climate risk

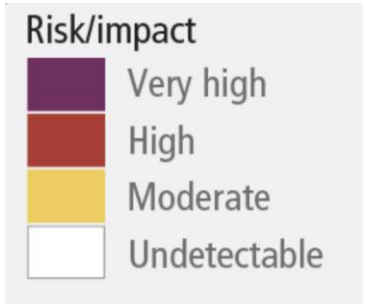
CAMBRIDGE ZERO $_2$

Frog in a pot of boiling water

“I like to imagine the frog has a chief scientific advisor”, Simon Sharpe, Five Times Faster

IPCC reasons for concern





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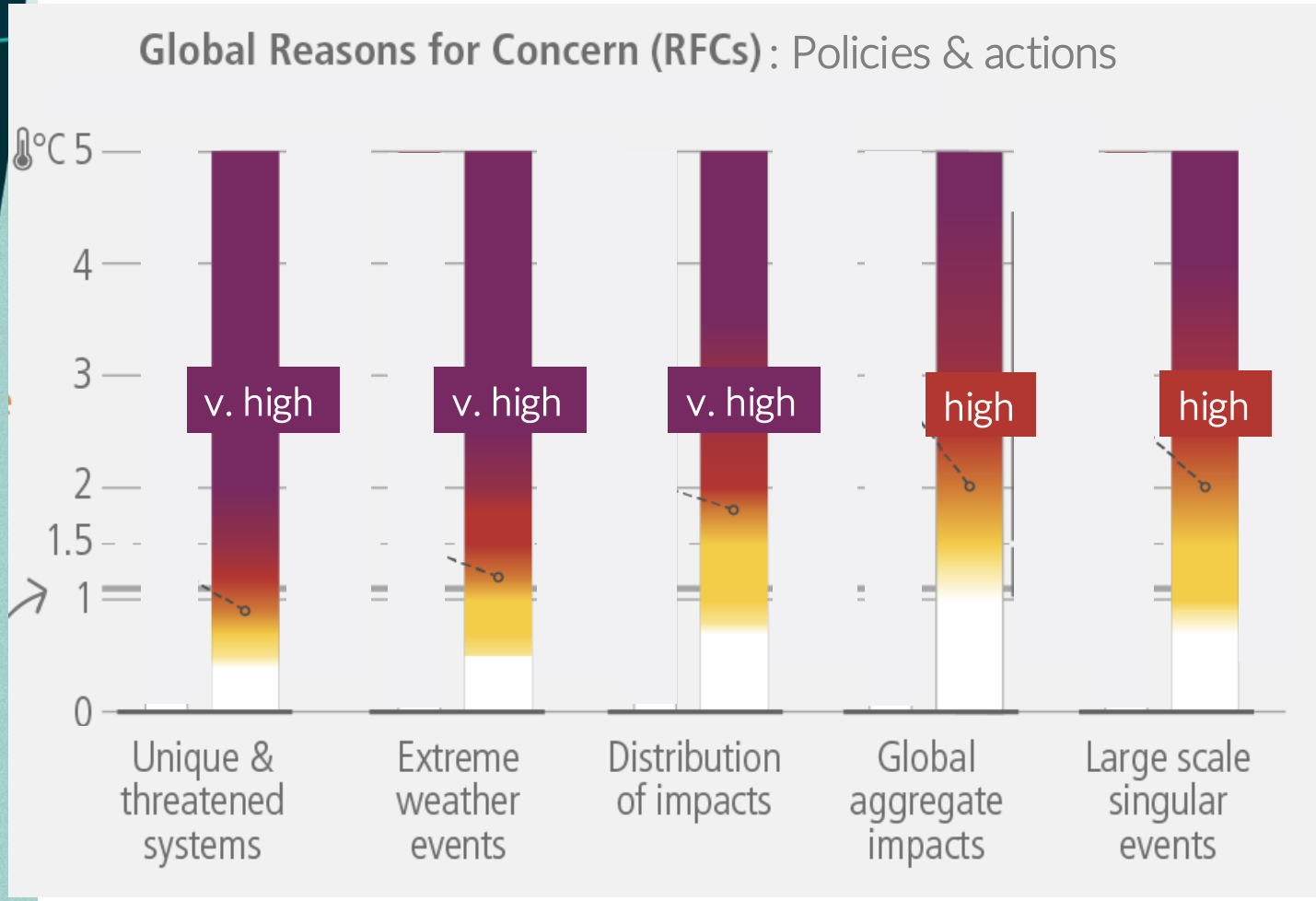
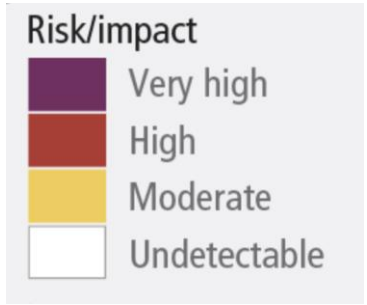
IPCC reasons for concern



Climate Action Tracker



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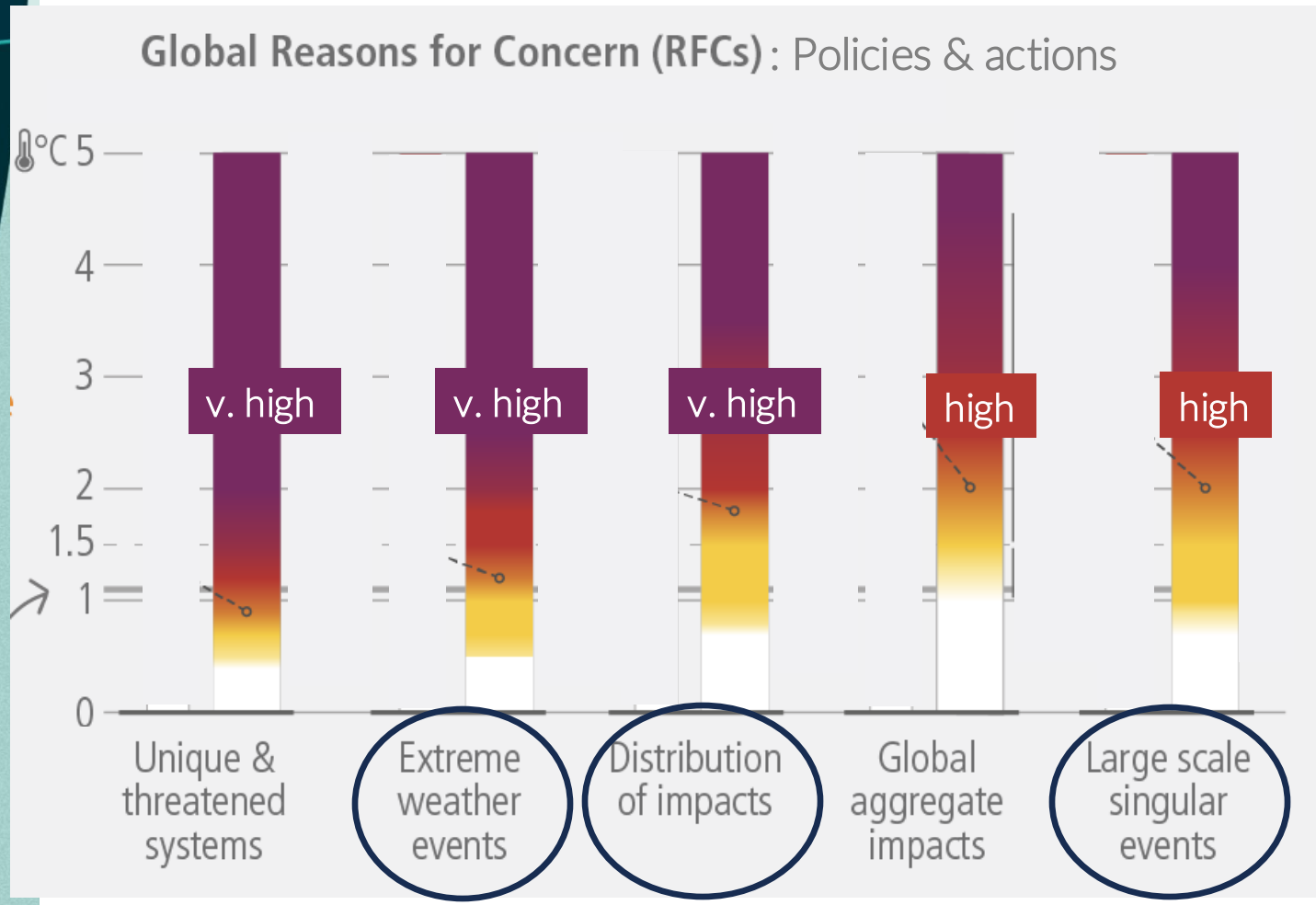
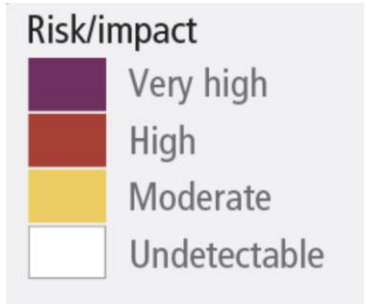
IPCC reasons for concern



Climate Action Tracker



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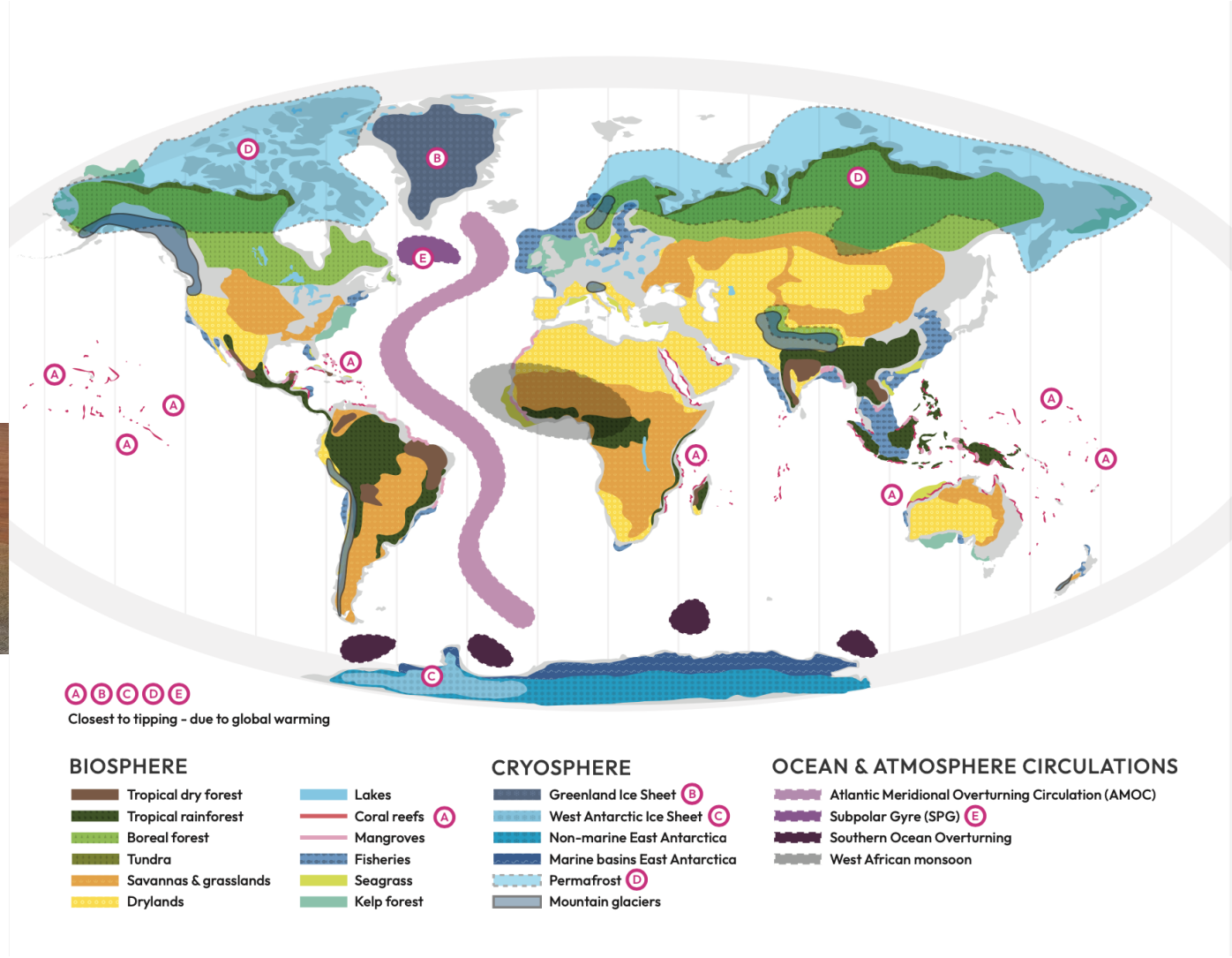
Tipping points



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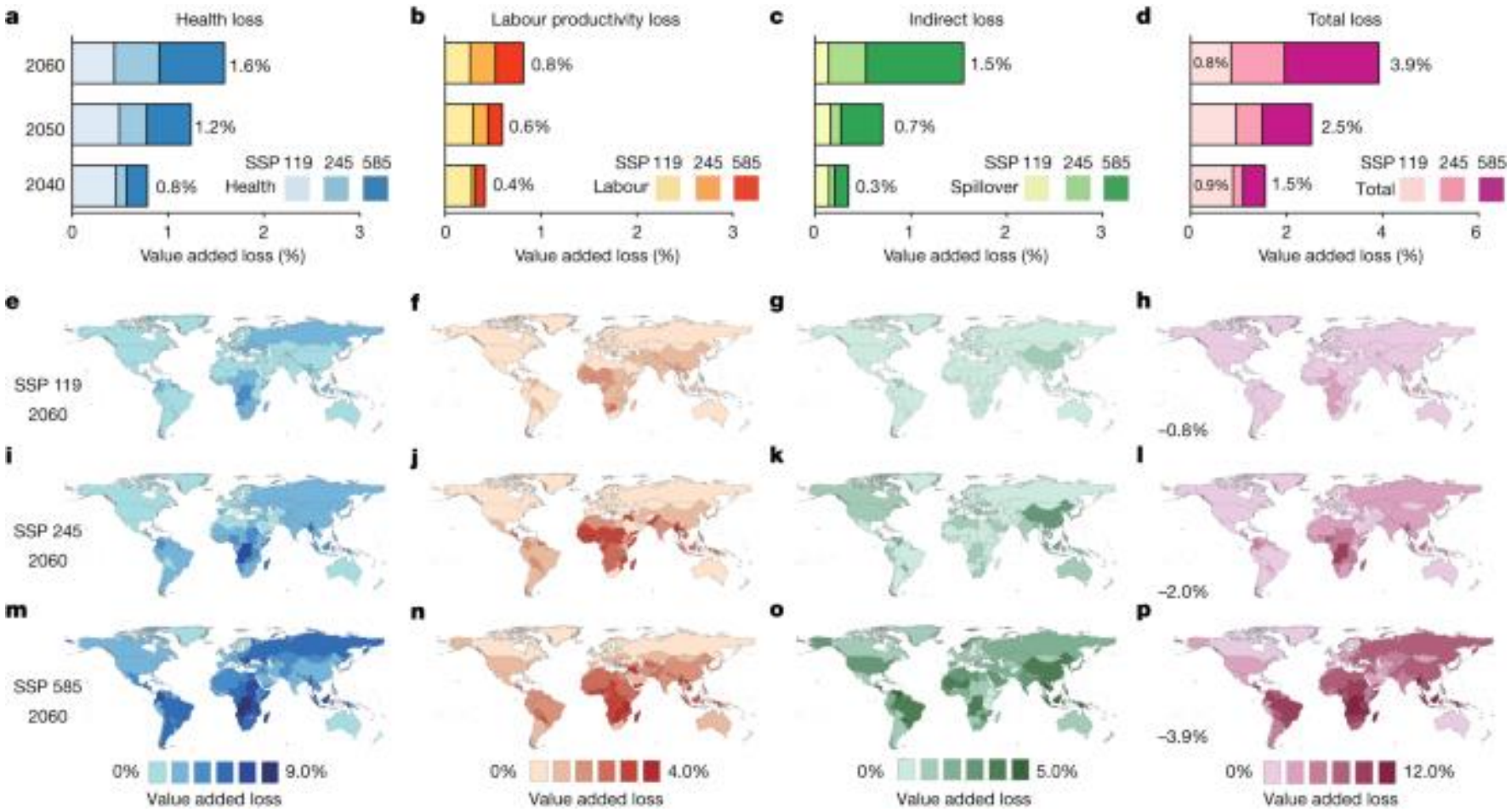
Lenton et al, 2023

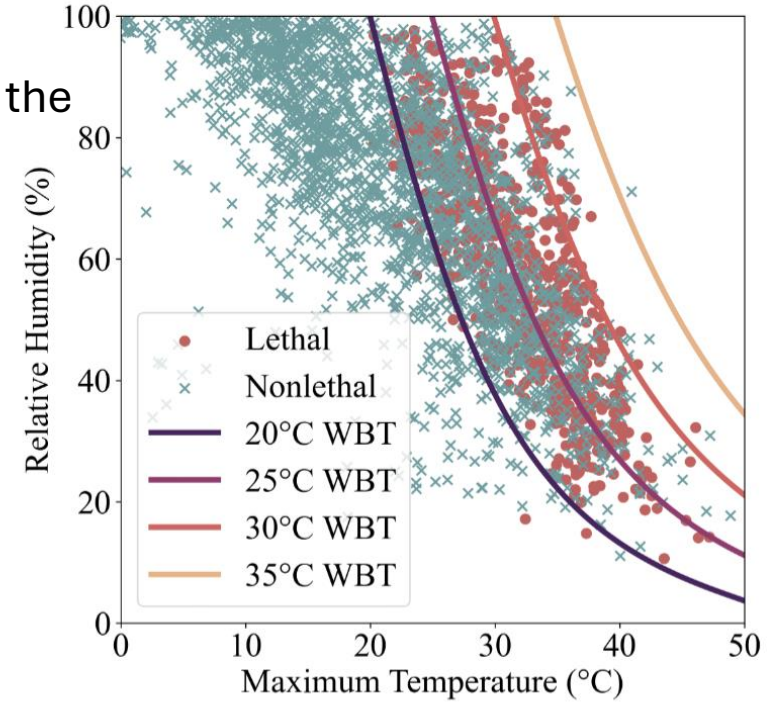
Distribution: e.g. supply chains



Sun et al, 2024

Extremes: e.g. lethal heatwaves

125,411 heatwave events occurring in 140 cities around the world; 979 lethal

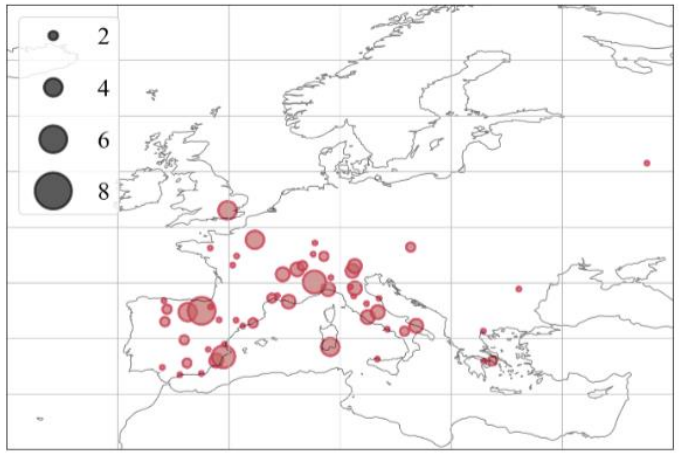


All these lethal heatwaves at WBT **below** 35C

Fig. 1 All lethal and a subset of nonlethal heatwaves as a function of maximum temperature and mean humidity during the heatwave with 20°C, 25°C, 30°C, and 35°C wet bulb temperature threshold boundaries.

Rouse et al, 2025 (pre-print)

Extremes: e.g. lethal heatwaves



(a) Observed lethal heatwaves

(c) Predicted lethal heatwaves

Threshold heatwaves & shock heatwaves

(i) population health
(ii) antecedent climate conditions
(iii) heatwave conditions

Rouse et al, 2025 (pre-print)

Implications for delivery across energy systems, finance flows, climate adaption and just transitions

Risk assessment approach is important for decision-making

New research approaches, especially AI/ML, are making new analysis possible

Requires transdisciplinary collaboration