LEARNING TO MANAGE CLIMATE RISK FOR COMPLEX SERVICES

Interdependencies, cascade risks and communication

AGENDA

- An introduction to Ben!
- Digital Health Climate Risk Management Overview
- Dealing with Interdependencies
- Thinking through the Cascade Risks
- My first go at Digital Climate Risk Tooling
- Getting Climate Risk onto Execs Radars

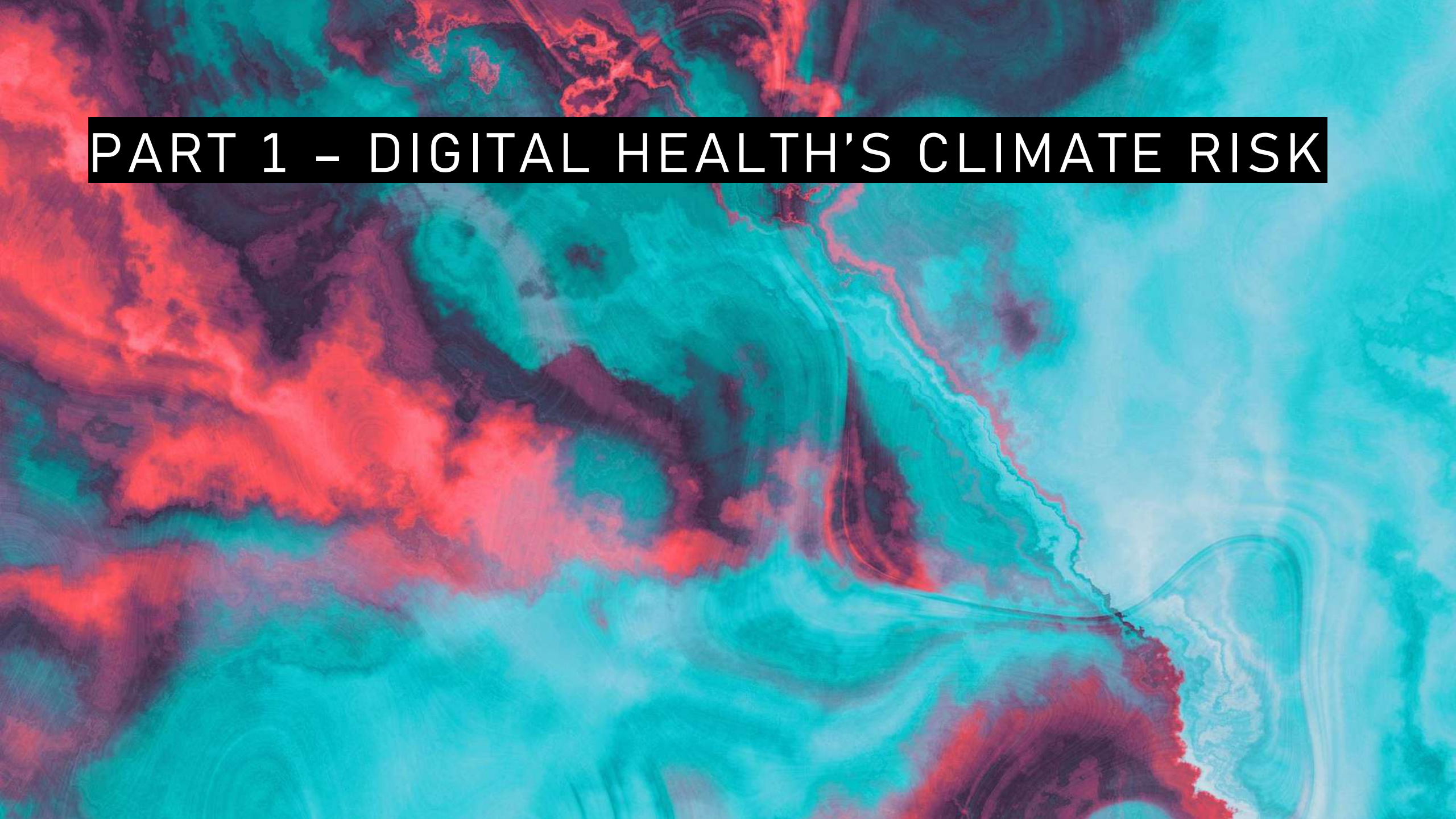
DISCLAIMER – THESE SLIDES ARE PURELY THE OPINION/NARRATIVE OF BEN TONGUE AND DO NOT REPRESENT ANY CORPORATE NHS PERSPECTIVE

Ben Tongue – Career public sector sustainability professional, digital sustainability in the NHS, interests in: circular economy, systems/doughnut thinking, risk based approaches, behavioural change. Co-Founder of the Cadence Roundtable, Trustee at The Green Estate

‘My meandering learning journey as a newbie part time climate risk manager in a complex risk management domain!’

Spoiler: Way more questions than answers!

ben.tongue@nhs.net



PART 1 – DIGITAL HEALTH'S CLIMATE RISK

ENVIRONMENTAL & DIGITAL RISKS = BIG PROBLEM!

FIGURE A

Global risks ranked by severity over the short and long term

"Please estimate the likely impact (severity) of the following risks over a 2-year and 10-year period"

Source – WEF Global Risk Reports

THE BIG CLIMATE RISKS FOR DIGITAL AND HEALTH

H1. Risks to health and wellbeing from high temperatures

H2. Opportunities for health and wellbeing from higher temperatures

H3. Risks to people, communities, and buildings from flooding

H12. Risks to health and social care delivery from extreme weather

H13. Risks to prison and education services from extreme weather

H7. Risks to health and wellbeing from changes to indoor and outdoor air quality

H8. Risks to health from vector borne diseases

ID9. Risk to UK public health from climate change overseas

H10. Risks to health from poor water quality or supply interruptions

I13. Risks to digital from high and low temperatures, high winds, lightning (I13)

I1. Risks to infrastructure networks (water, energy, transport, ICT) from cascading failures (I1)

I2. Risks to infrastructure services from river, surface water and groundwater flooding (I2)

I3. Risks to infrastructure services from coastal flooding and erosion (I3)

I7. Risks to subterranean and surface infrastructure from subsidence (I7)

ADAPTATION PLANNING IN DIGITAL AND HEALTH

techUK

THE UK'S CORE DIGITAL INFRASTRUCTURE: DATA CENTRES

CLIMATE CHANGE ADAPTATION AND RESILIENCE

Voluntary submission to DEFRA on behalf of the ICT (information, communications and technology) sector under the Adaptation Reporting Power (second round of reporting) as defined by the 2008 Climate Change Act

Source: Second/third round ARP returns – TechUK / NHSE

MY CLIMATE RISK MANAGEMENT OBLIGATIONS

Lots in Black and White!

- HMT Green Book (Business Case) – Accounting for the impacts of Climate Change
- HMG Greening Government Commitments – CCRA/management plan
- Tech Code of Practice Spend Controls – Resilient Tech programmes
- Health and Care Act – Achieve Climate Change Act

SOME COMPLEXITIES TO PONDER

- **Chain of connectivity** - as strong as the weakest link (geographically dispersed, multi-owner network)
- **Unit of assessment** - organisation, process, building etc? - programme/process framing is unusual
- **Burden/proportionality** – how big a problem is this!?
- **Best standard(s) to choose?** - BS8631/ISO14090/CCC Adaptation framework

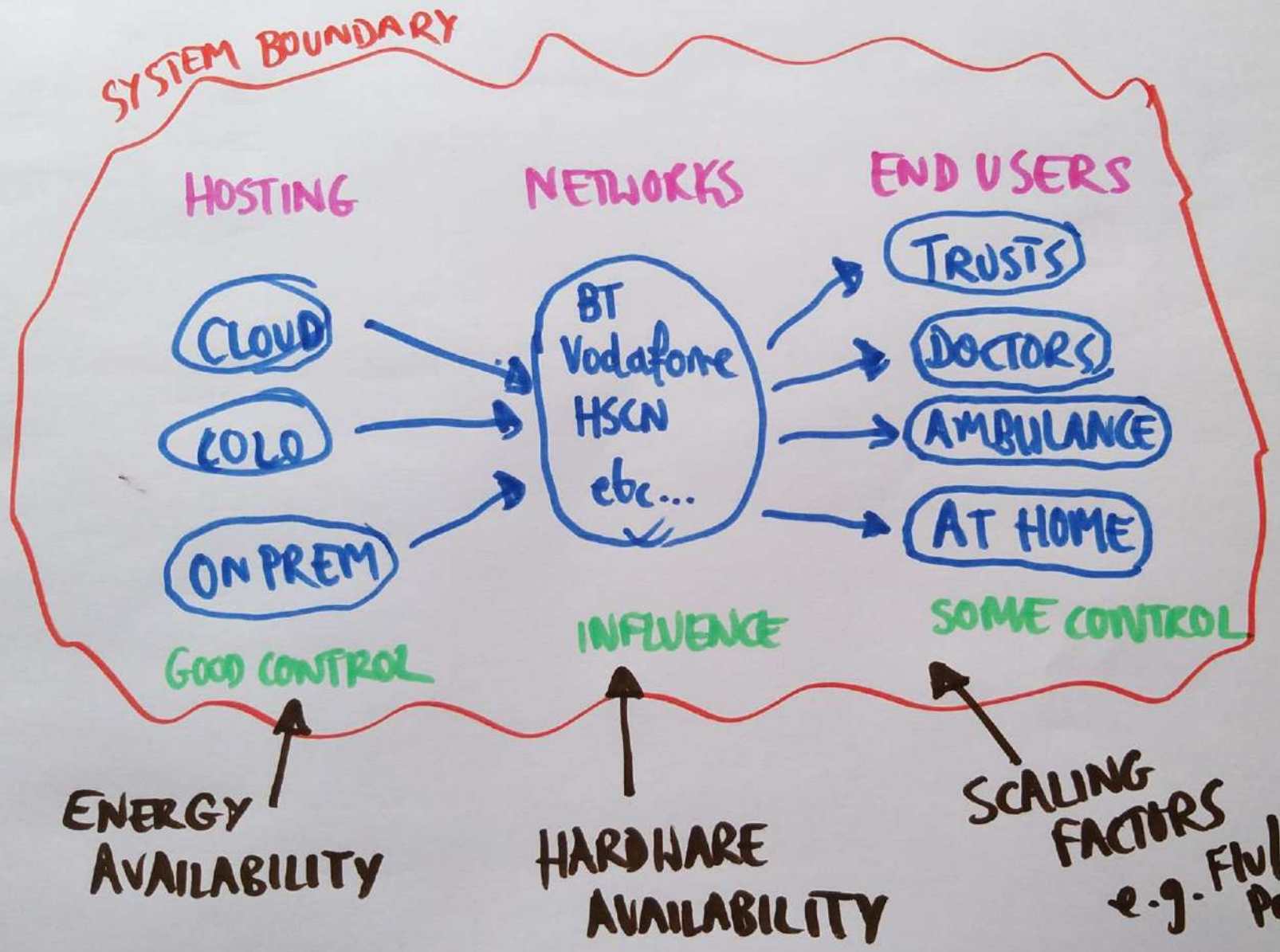
PART 2 - INTERDEPENDENCIES

How risks amplify each other....

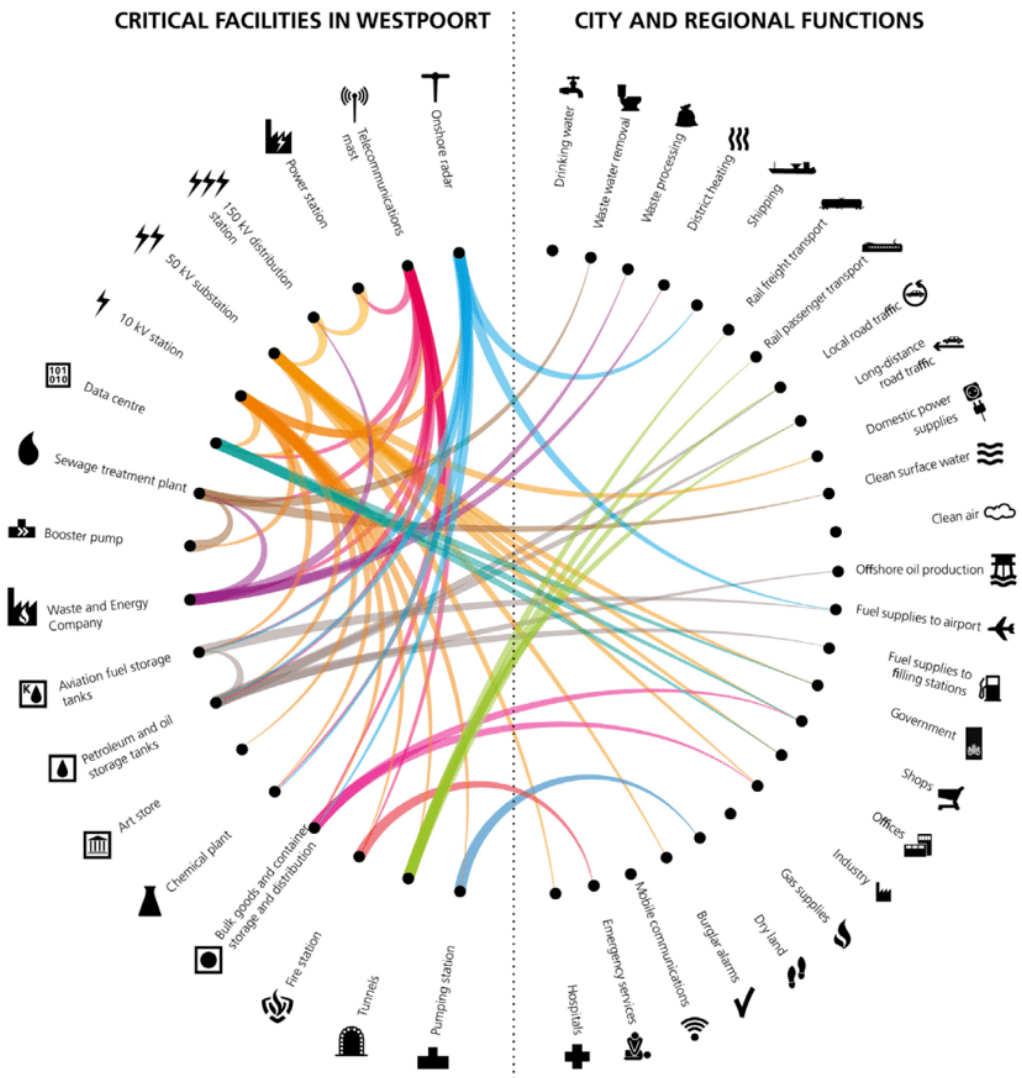
'Resilient Digital is Reliant on....?'

IF ONLY FOR A ‘SIMPLE’ PROBLEM(!?)

THE DATA 'CHAIN OF CONNECTIVITY'



DIGITAL AS PART OF CNI



C40 KNOWLEDGE

How to manage infrastructure interdependencies and cascading risk

UK Parliament

Committees

UK Parliament > Business > Committees > National Security Strategy (Joint Committee) > News Article

Call for Government to "get a grip" on climate change impacts

27 October 2022

A Committee of senior MPs and peers has implored the Government to get a proper grip on the major national security risks posed by the effects of climate change on critical national infrastructure (CNI), such as power, water, transport and communications.

1ST ORDER DIGITAL HEALTH EXAMPLE - HEATWAVE

London NHS trust cancels operations as IT system fails in heatwave

Guy's and St Thomas' trust having to postpone and divert appointments, with doctors unable to see patients' notes

Both of the trust's data centres, one at Guy's hospital and the other at St Thomas', stopped working on Tuesday afternoon. Photograph: Maureen McLean/Rex/Shutterstock

One of the NHS's biggest hospital trusts is facing major problems after its IT system failed because of the extreme temperatures earlier this week.

Lessons learnt report recommendations:

- Strategic plan for future events
- Set formal accountabilitites and responsibilities
- Alert NHS England to wider sector risk
- Carry out emergency drills for future heatwaves
- Support staff suffering from stress from the event
- Clinical guidance for non-digital decision making
- Have effective paper based fallback processes
- Ensure data recovery is sound
- Full register of assets/software to help recovery
- No single points of failure in staff capabilities
- Plan for communications in major incidents
- Review cooling, air handling and flood prevention
- https://www.guysandstthomas.nhs.uk/sites/default/files/2023-01/IT-critical-incident-review.pdf

2ND ORDER DIGITAL HEALTH EXAMPLE - PANDEMIC

WalesOnline NEWS RUGBY FOOTBALL IN YOUR AREA WHAT'S ON MORE

NHS Covid tracing app does not work on older phones

Health Secretary Matt Hancock told BBC Breakfast the "vast majority" of people had the right software, adding that some may need to upgrade their phone's operating system

NEWS By Neil Shaw Network Content Editor (Live and Trends)

08:07, 24 SEP 2020 | UPDATED 09:08, 24 SEP 2020

DISCUSSION – HOW ARE YOU DEALING
WITH INTERDEPENDENCIES?

PART 3 – CASCADE RISKS

How risks create chains of events….

‘(Climate Driven) Digital Failure causes….?’

GOVERNMENT PREPARATION FOR ENERGY OUTAGES

Government tests energy blackout emergency plans as supply fears grow

Exclusive: Whitehall officials have 'war gamed' Programme Yarrow, a blueprint for coping with outages for up to a week

Concerns over the impact of an energy blackout have grown since the start of Russia's war on Ukraine. Photograph: Jon Bower/Alamy

The government has "war gamed" emergency plans to cope with energy blackouts lasting up to seven days in the event of a national power outage amid growing fears over security of supply this winter.

UKCCC Climate Risk Assessment 2021 – Exec Summary

CASE STUDY: STORMS

BBC Ben Home News Sport Weather iP

NEWS

Home | Cost of Living | War in Ukraine | Coronavirus | Climate | UK | World | Business | P

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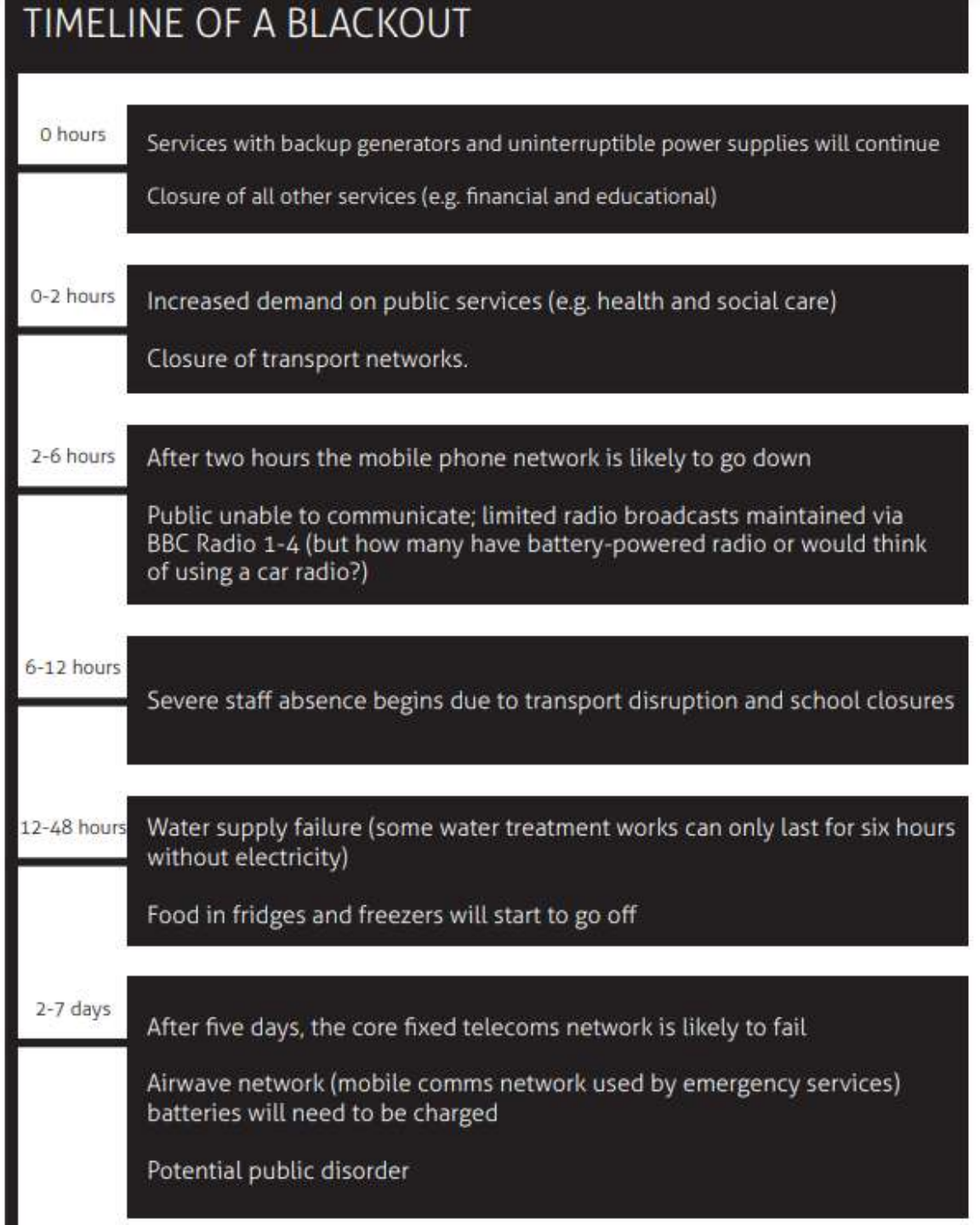
Substation flooding leaves 55,000 Lancaster homes without power

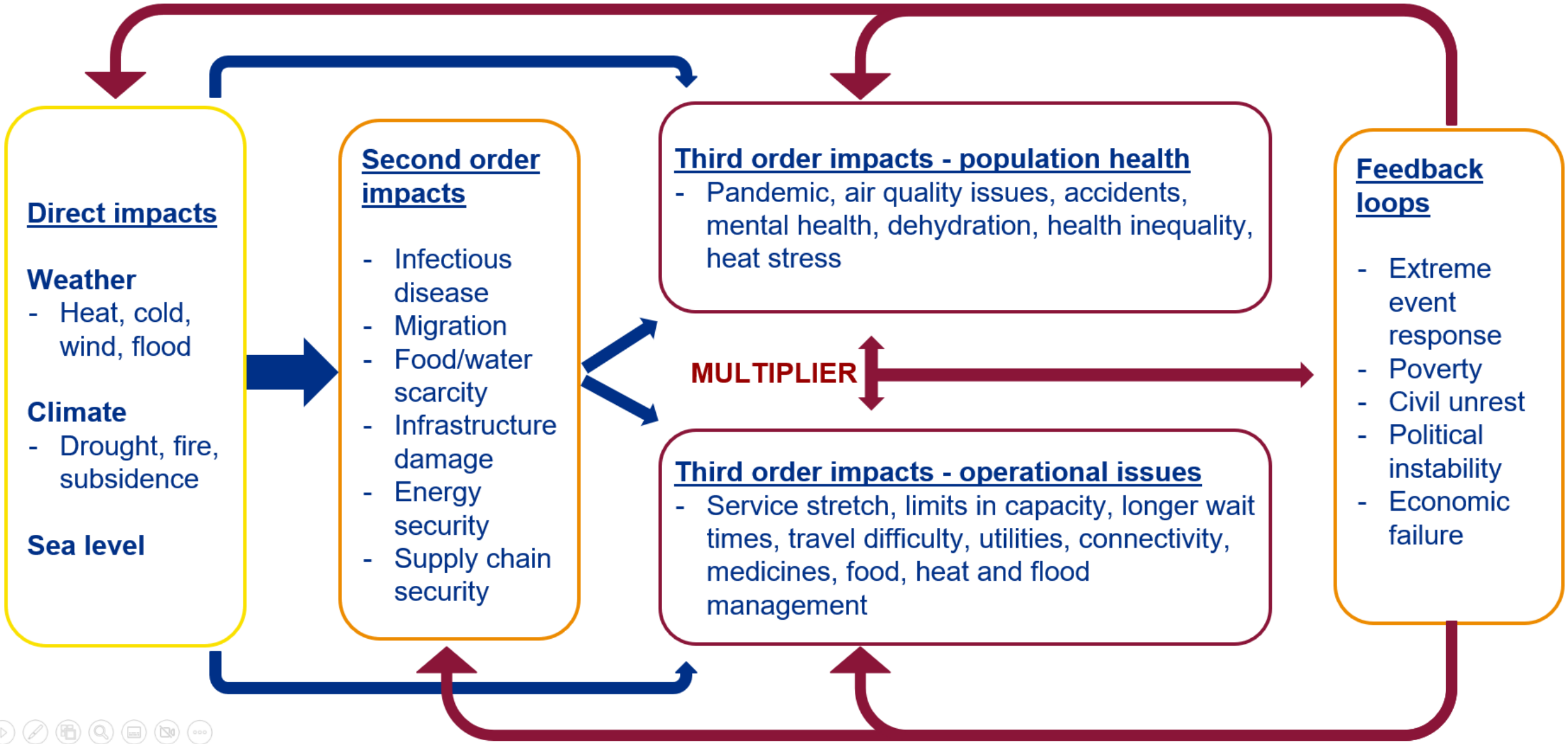
6 December 2015

Simple Cascade = Storm → Energy Outage → Digital Failure → Societal Bad Stuff…

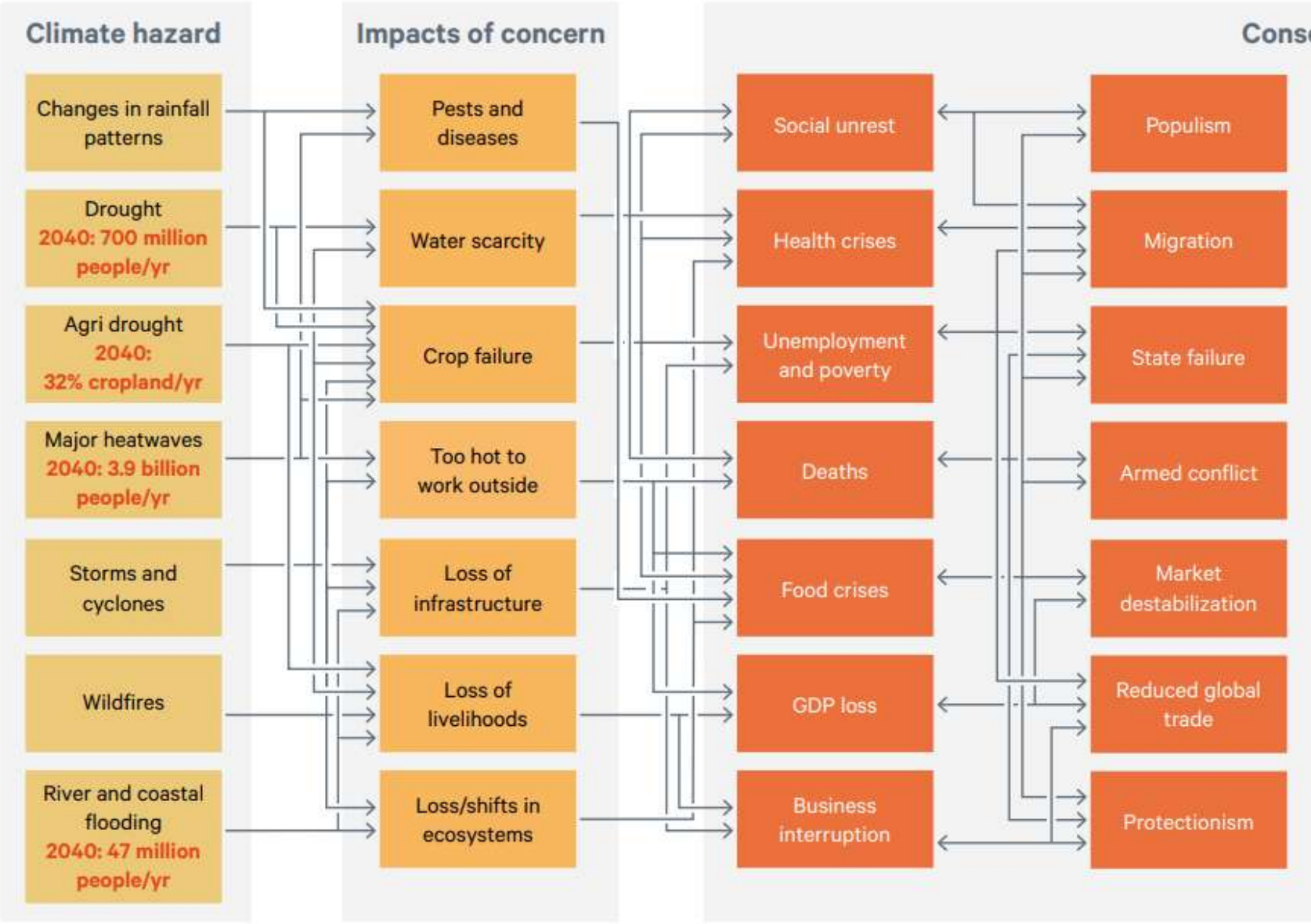
https://www.theblackoutreport.co.uk/



CASCADE RISKS IN HEALTH



CHATHAM HOUSE CLIMATE RISK ASSESSMENT 2021



Migration and displacement of people

- Rural to urban
- Refugee crisis
- Forced/unsafe migration
- Forced immobility (trapped populations)

Armed conflict

- Regional conflicts
- Rise of extremist groups
- Police/military intervention
- Organized crime and violence
- Conflict between people and states
- Civil war and war

Destabilization of markets

- Commodity price spikes
- Fall of asset prices
- Large-scale asset sell-off
- Falling stock markets
- Underfunded pension funds
- Financial market collapse

INTERPLAY BETWEEN CLIMATE AND OTHER RISKS

THE WALL STREET JOURNAL.

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BUSINESS

Ship Stuck in Suez Canal and Chip Shortages: What Global Supply-Chain Problems Mean for You

The blocked Suez, semiconductor shortages and surprisingly cold weather have disrupted how manufacturers world-wide ship and receive goods

DISCUSSION – HOW ARE YOU DEALING
WITH CASCADE RISKS?

PART 4 – MY DIGITAL CLIMATE RISK PROTOTYPE TOOL

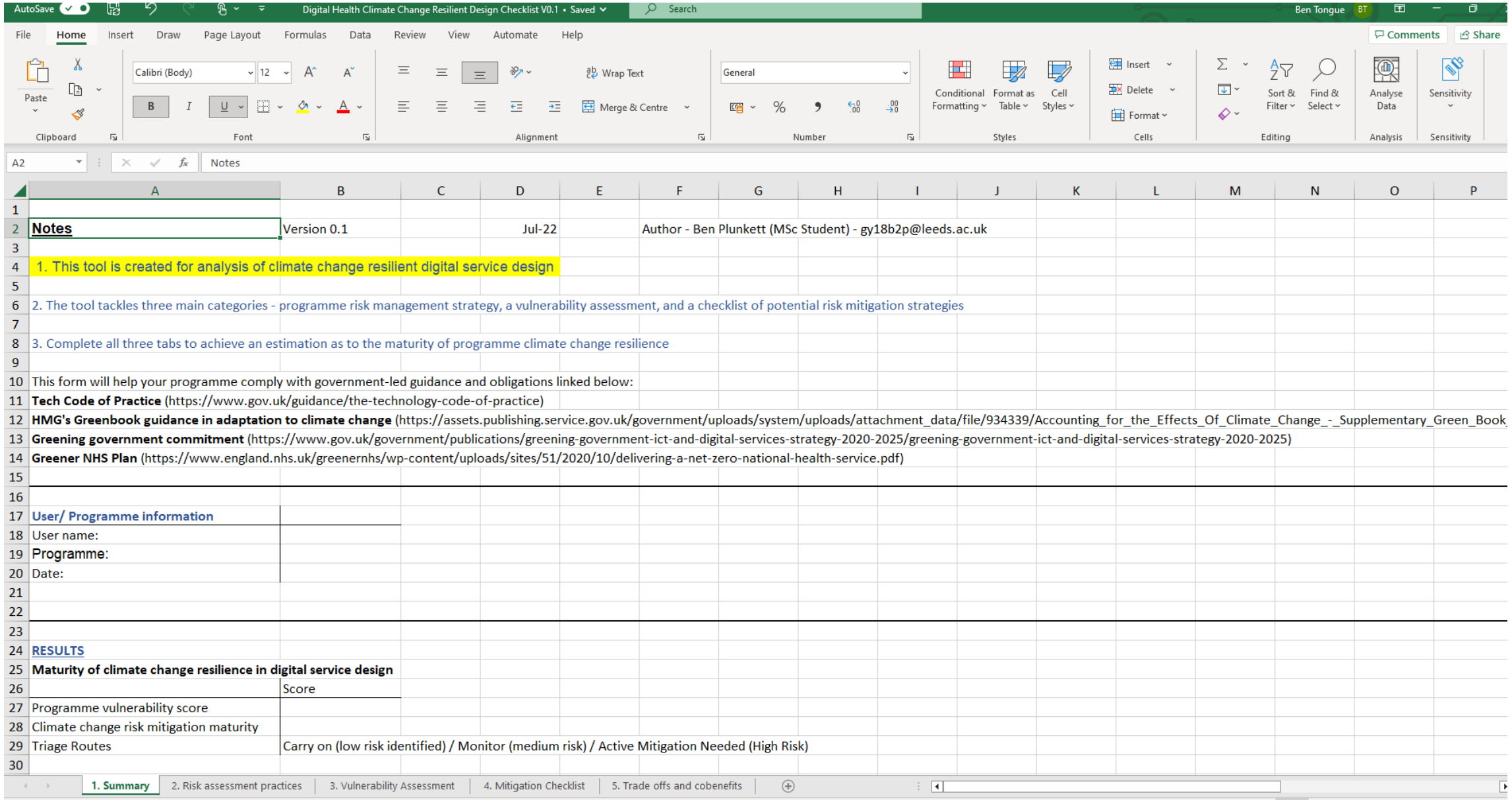
WHAT IS IT? (AND WHAT ISN'T IT!?)

Developed in Summer 2022 with an MSc from University of Leeds sustainability consultancy course

It is a conversation starting tool that aims to get digital health programmes understanding the key considerations for thinking about climate risk in their services and how to start measuring and managing it.

It isn't a fully blown tool allowing compliance with climate risk management obligations – that would to too difficult currently in terms of burden, skills and resourcing. It would not be seen as proportionate.

PROTOTYPE DEMONSTRATION



AutoSave | Digital Health Climate Change Resilient Design Checklist V0.1 • Saved | Search | Ben Tongue

File Home Insert Draw Page Layout Formulas Data Review View Automate Help | Comments | Share

Paste | Calibri (Body) 12 | Wrap Text | General | Conditional Formatting | Format as Table | Cell Styles | Insert | Delete | Format | Sort & Filter | Find & Select | Analyse Data | Sensitivity

Clipboard | Font | Alignment | Number | Styles | Cells | Editing | Analysis | Sensitivity

A2 | Notes

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1																
2	**Notes**	Version 0.1		Jul-22		Author - Ben Plunkett (MSc Student) - gy18b2p@leeds.ac.uk										
3																
4	1. This tool is created for analysis of climate change resilient digital service design															
5																
6	2. The tool tackles three main categories - programme risk management strategy, a vulnerability assessment, and a checklist of potential risk mitigation strategies															
7																
8	3. Complete all three tabs to achieve an estimation as to the maturity of programme climate change resilience															
9																
10	This form will help your programme comply with government-led guidance and obligations linked below:															
11	**Tech Code of Practice** (https://www.gov.uk/guidance/the-technology-code-of-practice)															
12	**HMG's Greenbook guidance in adaptation to climate change** (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/934339/Accounting_for_the_Effects_Of_Climate_Change_-_Supplementary_Green_Book_															
13	**Greening government commitment** (https://www.gov.uk/government/publications/greening-government-ict-and-digital-services-strategy-2020-2025/greening-government-ict-and-digital-services-strategy-2020-2025)															
14	**Greener NHS Plan** (https://www.england.nhs.uk/greenernhs/wp-content/uploads/sites/51/2020/10/delivering-a-net-zero-national-health-service.pdf)															
15																
16																
17	**User/ Programme information**															
18	User name:															
19	Programme:															
20	Date:															
21																
22																
23																
24	**RESULTS**															
25	**Maturity of climate change resilience in digital service design**															
26		Score														
27	Programme vulnerability score															
28	Climate change risk mitigation maturity															
29	Triage Routes	Carry on (low risk identified) / Monitor (medium risk) / Active Mitigation Needed (High Risk)														
30																

1. Summary | 2. Risk assessment practices | 3. Vulnerability Assessment | 4. Mitigation Checklist | 5. Trade offs and cobenefits

DEVELOPMENT OF A SCORING TRIAGE SYSTEM

We aim to embed a quantitative element into the tooling – forming a score as to a digital health programme's maturity in climate change resilience. This scoring will create a triage output to either recommend;
1. Continuing current processes (best scenario),
2. Monitoring (areas for improvement),
3. Adaptation needed (serious vulnerabilities identified)

Proposed formula –
Each question will produce a 1 or a 0 output – based upon whether the answer is positive or negative.

General formula: Climate change resilience maturity = risk assessment practices + mitigation measures – vulnerability assessment
Risk assessment tab will produce a score out of 15 – used as a percentage e.g. 12/15 would be 80% or 0.8
Vulnerability assessment will produce a score out of 27 – 1 for low, 2 for medium, 3 for high. Scoring will be used as a decimal again.

Mitigation checklist will produce a score out of 20 – 1 for a positive answer, 0 for negative answer. Again used as a percentage
Max score = 2

Triage output: Minus result: Adaptation needed/0-1: Monitoring /1-2: Continue current processes

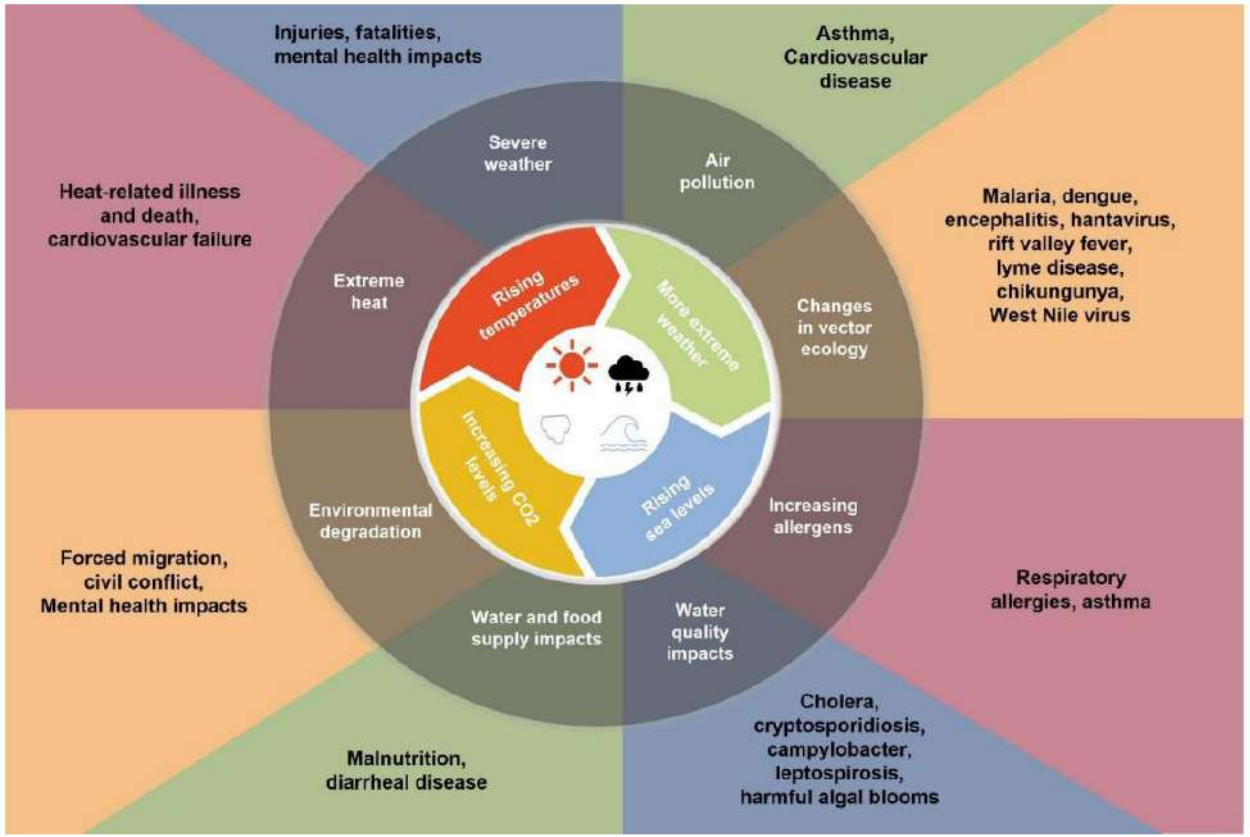
FEEDBACK AND DISCUSSION

Topic	Feedback	Next steps?
Tooling application within business practices	Some confusion as to how this would fit within current practices? – who would conduct it? In what stage of development? How often?	Participants suggested that this would most likely fit within current risk assessment practices – to become a part of best practice – conducted in unison with ongoing business continuity plans and risk assessments
Scoring	The clarity in the calculations questioned around the scoring system was questioned – how is the maturity score developed? What will the user do with the score that is produced?	A quantitative metric is one of the key next steps in this checklist – very difficult given the complex nature of calculating resilience (how do you weight each section) – but an example of how this might be done is provided in the 'next steps' section
Language	Some of the language chosen in the questions was also questioned – argued as too wordy/ broad	Questions that participants described as confusing are highlighted in the spreadsheet – rewording of these questions is needed
Instructions need to be clearer	Not a clear link between how the different tabs all fit together	Will become a lot clearer for the user once the scoring metric is finalised – will understand how each tab contributes to the overall maturity score
Format of the checklist questioned	Excel spreadsheet method may not be the most efficient way of organising this – some people favoured for it to be uploaded to a website so it is easily accessible	Once the content of the checklist is finalised there may be a benefit in uploading it online to be more easily accessible for potential users
Vulnerability tab	Participants questioned whether it was too broad a scope, and whether this made it superficial	Aim of the tab is to provide a general outlook on the most material hazards therefore it was decided that this feedback should not be acted upon. If the tab was to become more specific would only increase the complexity and make it difficult for the user to fill out (i.e. focusing on more specific hazards such as fluvial vs pluvial flooding)

PART 5 – GETTING EXEC LEVEL BUY-IN ON CLIMATE RISK

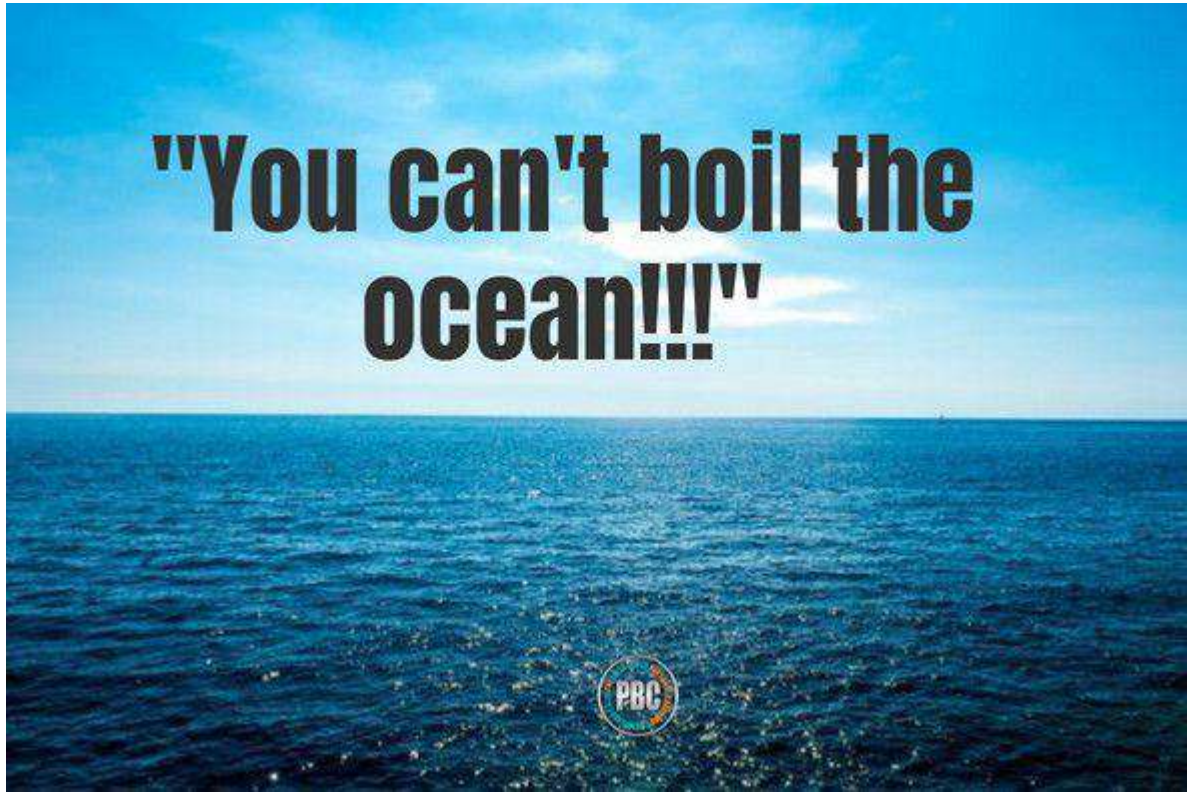
Concise, effective (and emotive?) communication to enhance prioritisation

MAKING THE CASE FOR CONSIDERATION



NOTE: DEFRA ARP consultation looking to widen scope to include interdependencies!

WHAT'S MY PROBLEM TO SOLVE!?



But can I be sure other people are solving their parts of the problem!?

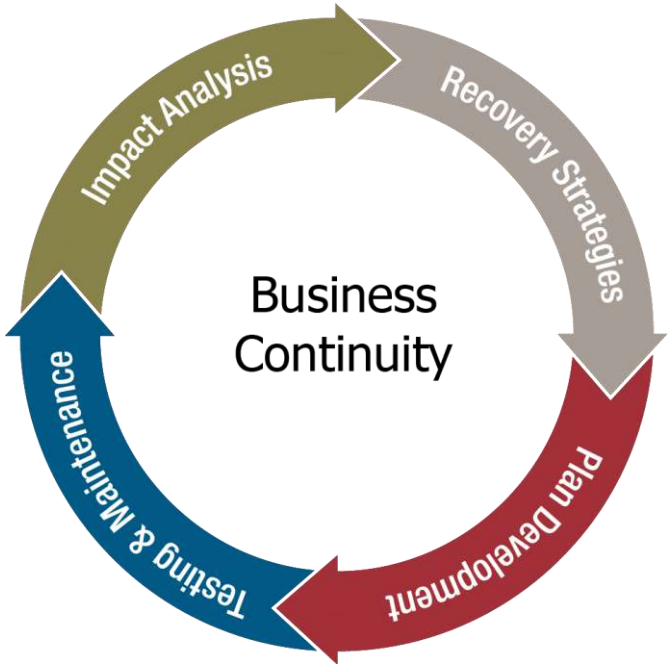
PIGGY-BACKING ON 'MORE IMPORTANT' RISKS

WHAT IS CYBER RISK MANAGEMENT?

1. Risk assessment
2. Physician and staff training
3. Resources
4. IT services
5. Cyber liability insurance

Cyber functions have an understanding of the impact of cyber triggered digital outages on the system – the climate change version of this could be hugely powerful!

WEAKNESSES OF THE BUSINESS CONTINUITY FRAME



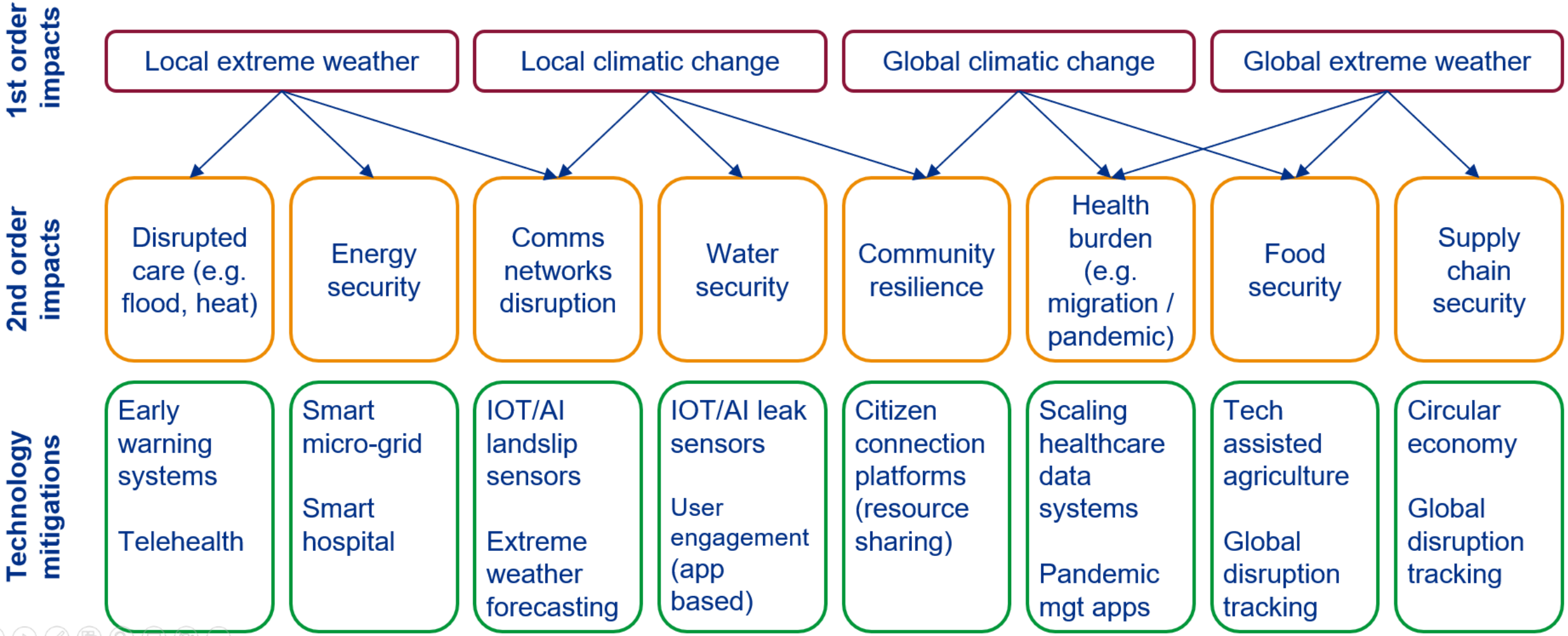
Reactive – trigger agnostic – cures disruption

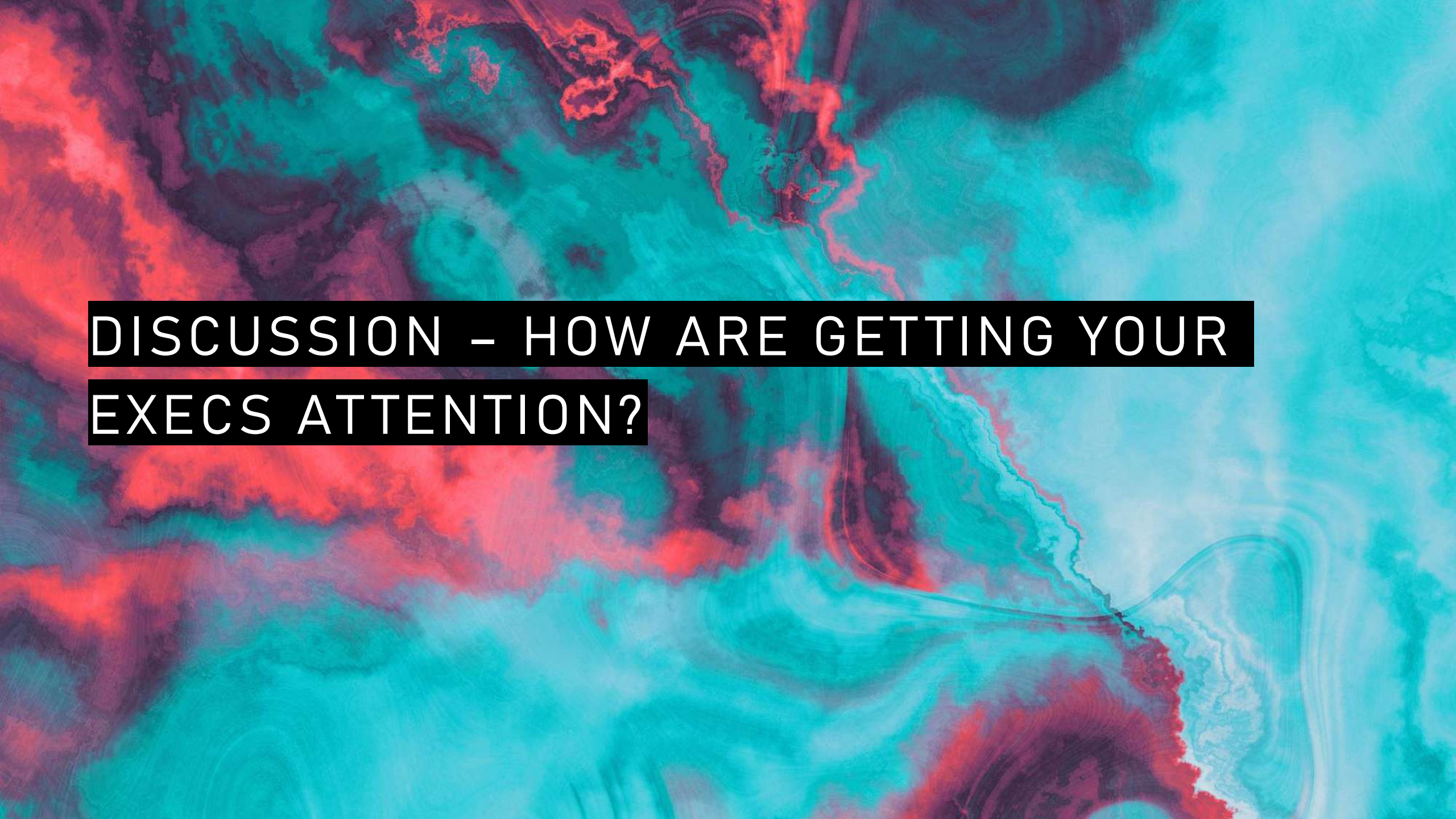
Proactive – trigger specific – prevents disruption

"Managing climate change resilience through business continuity is like managing a hospital by A&E"

FINDING A GOOD NEWS STORY

This diagram provides a broader view of how technology can be used to respond to or mitigate the impacts of climate change




DISCUSSION – HOW ARE GETTING YOUR
EXECS ATTENTION?

THE END!