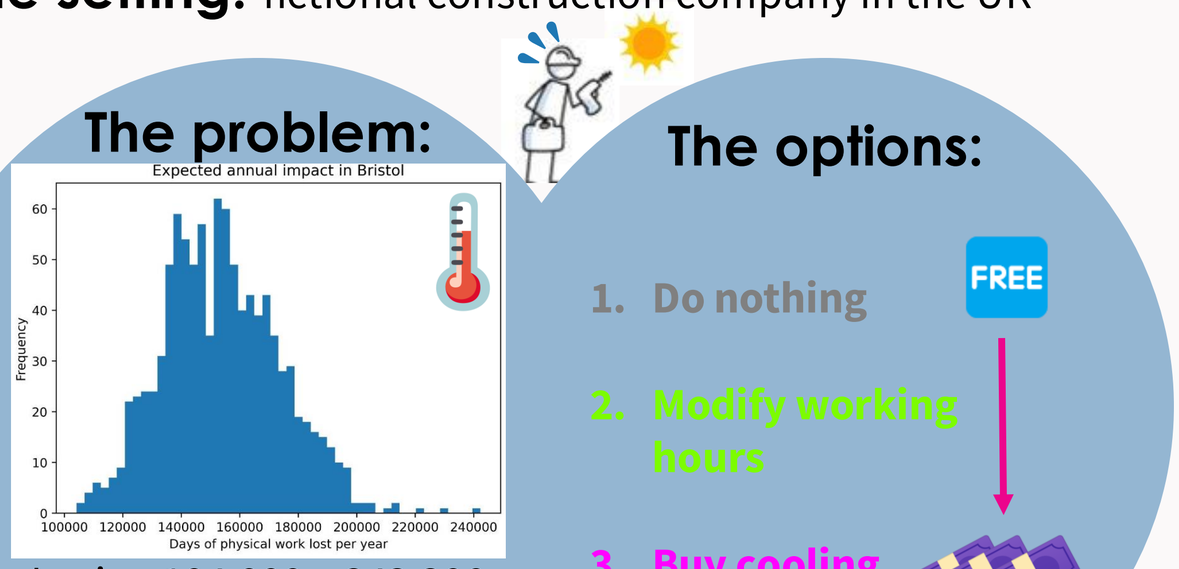
How should we adapt to climate change... ...when we are uncertain about everything?

Cecina Babich Morrow[1,2], Laura Dawkins[2], Dennis Prangle[1], Dan Bernie[1,2]
[1]University of Bristol, [2]Met Office

A fictional example

The setting: fictional construction company in the UK



Decision-making in one location

Risk-related inputs

Hazard: How hot will it be?

Exposure: How many people will work here?

Vulnerability: How much will heat affect them?

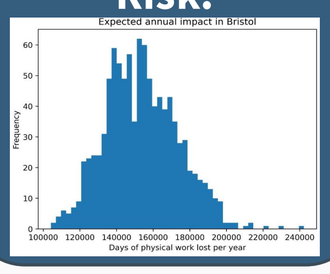
Decision-related inputs

Decision attributes:

Cost / person	Added daily cost	Daily savings
£0	£0	£0
£100	£20	£50
£500	£2	£80

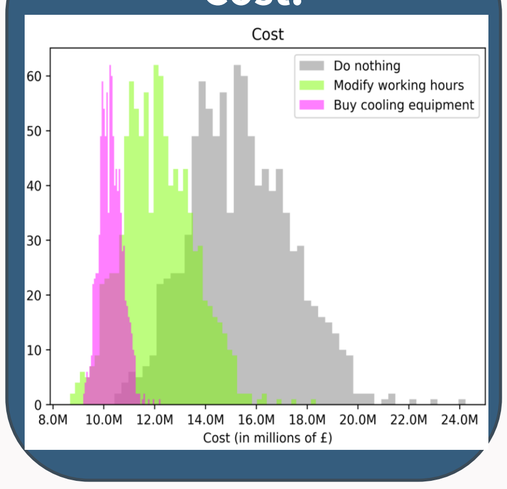
⚠ All of our inputs are uncertain! ⚠

Risk:

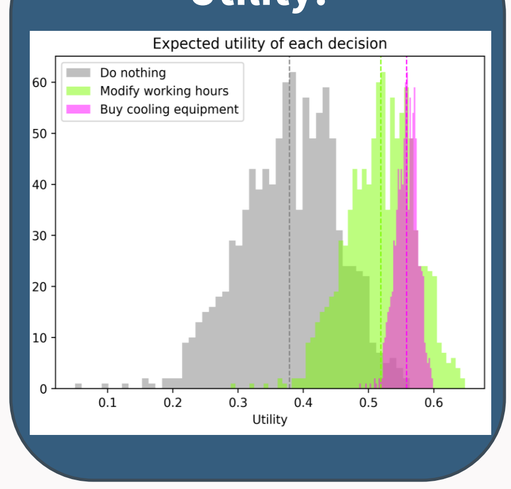


For a particular set of input values, **buying cooling equipment** has the highest expected value to our company in Bristol:

Cost:



Utility:



Uncertainty analysis

If we try all possible values of our inputs across the UK...

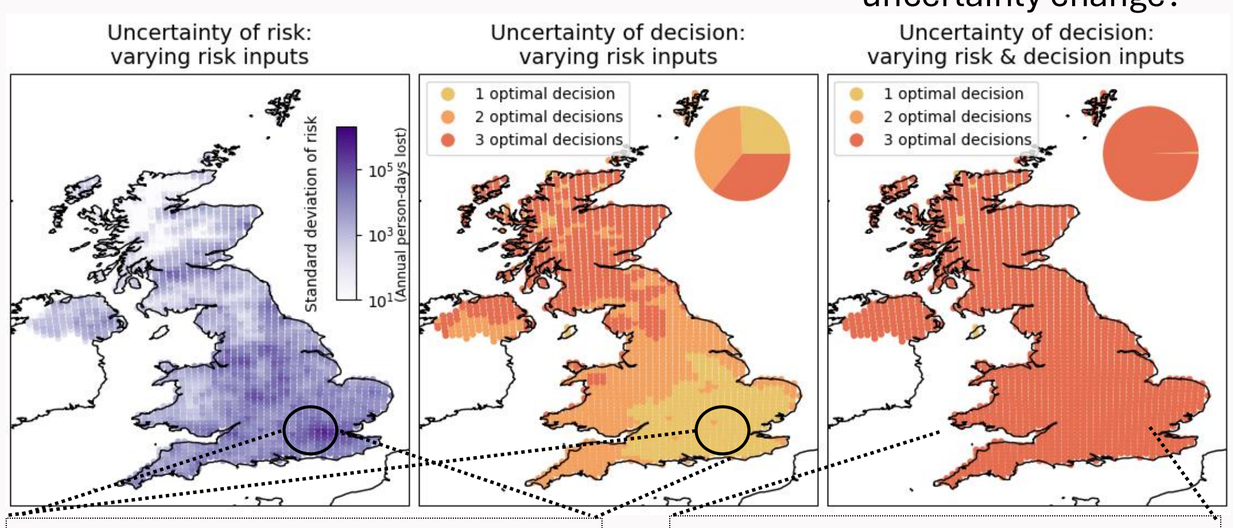
- Different levels of warming
- Different numbers of employees
- Different vulnerabilities to heat
- Different costs and efficacies of each decision option

...how much does our decision change?

Varying all risk-related inputs, how uncertain is...

Also varying decision-related inputs...

the predicted risk? | the optimal decision? | how does decision uncertainty change?



Greatest uncertainty in risk, but only **one optimal decision**

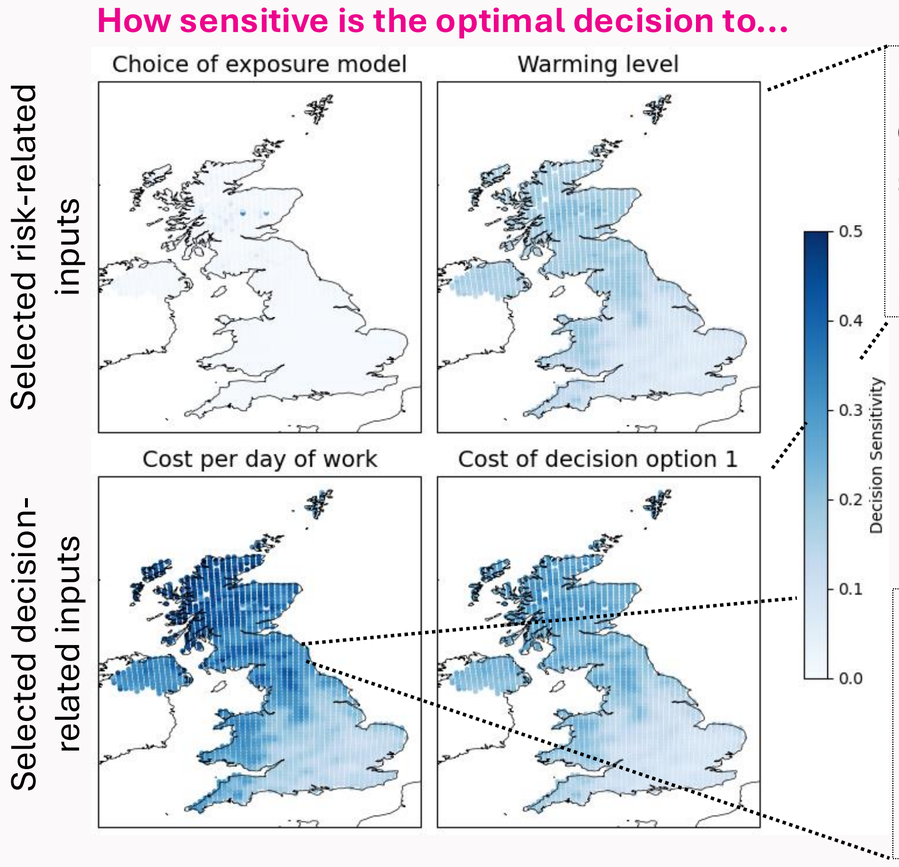
Now **any decision** could be optimal in most locations

Sometimes we can be **confident in our decision**, even when we are **uncertain about the level of risk**.

Sensitivity analysis

How much does uncertainty in each of our inputs lead to uncertainty in our decision?

How sensitive is the optimal decision to...



Decision is often **less sensitive** to the risk-related inputs

Some inputs have a **greater impact** on the decision in certain regions

Sensitivity analysis tells us **which inputs** we need to learn more about in order to make **a decision we can be confident in**.

By investigating the uncertainty of our decisions, we can be as confident as possible despite uncertainty in our inputs.

What's next?

Apply this decision-making framework to a **real-world example** to understand uncertainty and sensitivity in a more complex context.

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