Data Breaches:
Their Cost, Who Bears It & The Future

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Today's presentation

- Why is cyber risk management difficult?
- Who suffers breaches and how much do they cost?
- How is the cost likely to change in the near future?

Why is cyber risk management difficult?

• Impossible to reach 100% security

• Limited resources to invest in security measures

• Each $ spent has diminishing marginal (security) benefits

It is difficult to allocate the money optimally:
  • Cybersecurity is an area where the outcomes are rarely measured (Florencio & Herley, 2014)
  • Iatrogenics - Some measures make the problem(s) worse
    • Strong passwords (Zhang et al, 2010; Chiasson & van Oorschot, 2015)
    • High-jacking of patching supply chain (e.g. Ccleaner)
    • Phishing breach notification letters (e.g. Equifax)

Using the past as a guide to the future
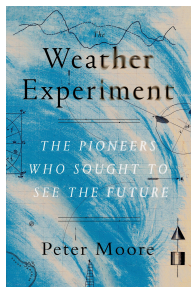
"It's not so ridiculous as some Honourable Gentlemen appear to suppose"
Member of Parliament for Carlow in response to laughter at the idea of predicting the weather 24 hours in advance, 1854

For effective risk management, need to understand:
- Probability of incidents
- Range of likely (economic) impacts
- Effectiveness of security measures

The cost of data breaches has not been accurately estimated in the past

Equifax: Liabilities Will Exceed $1 Billion

NEWS

Analyst sees Target data breach costs topping $1 billion

Food & Lifestyle

Target's data breach fraud cost could top $1 billion: analyst

TJX's failure to secure Wi-Fi could cost $1B

RYAN SINGEL   SECURITY   03.30.07   10:10 AM

DATA BREACH WILL COST TJX $1.7B, SECURITY FIRM ESTIMATES

The average cost of a data breach is now $4 million
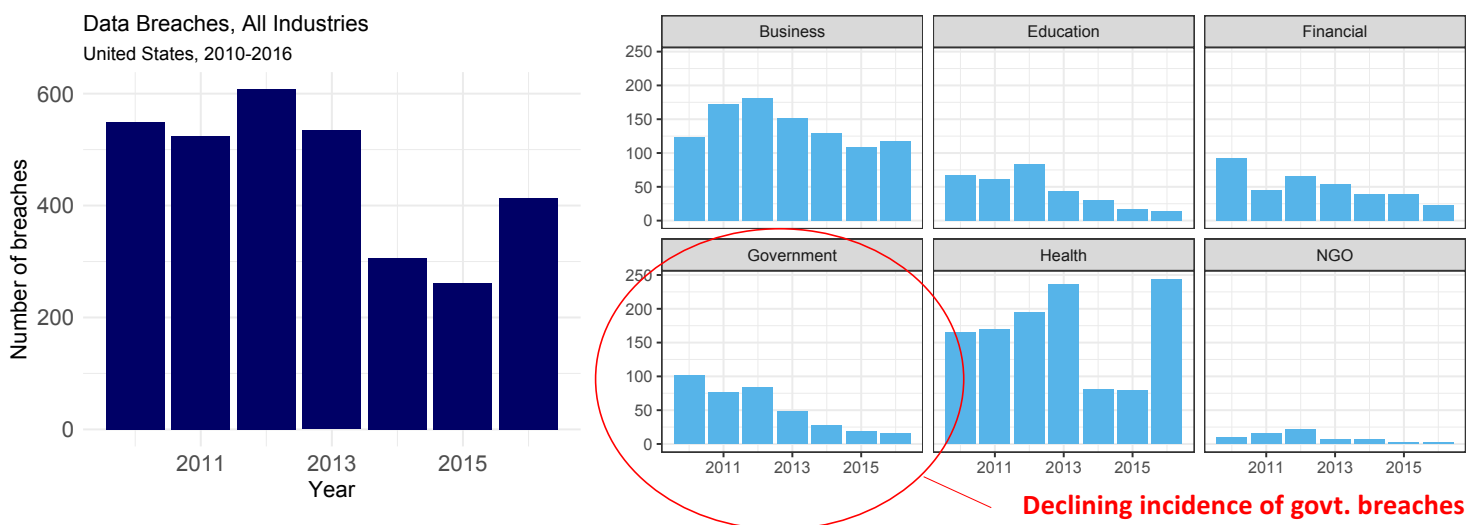
Breaches don't affect every sector equally

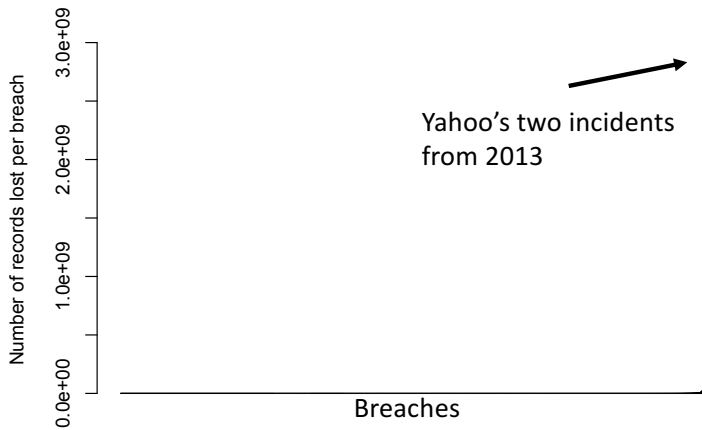## Number of data breaches, all organisations by sector, USA, 2010-2016

Data Breaches, All Industries
United States, 2010-2016

Breaches don't affect every sector equally

Number of data breaches, all organisations by sector, USA, 2010-2016

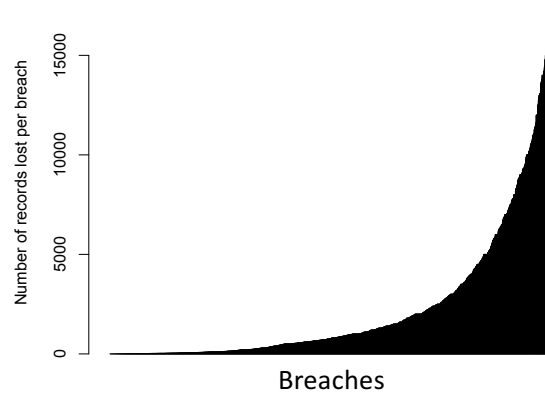Declining incidence of govt. breaches
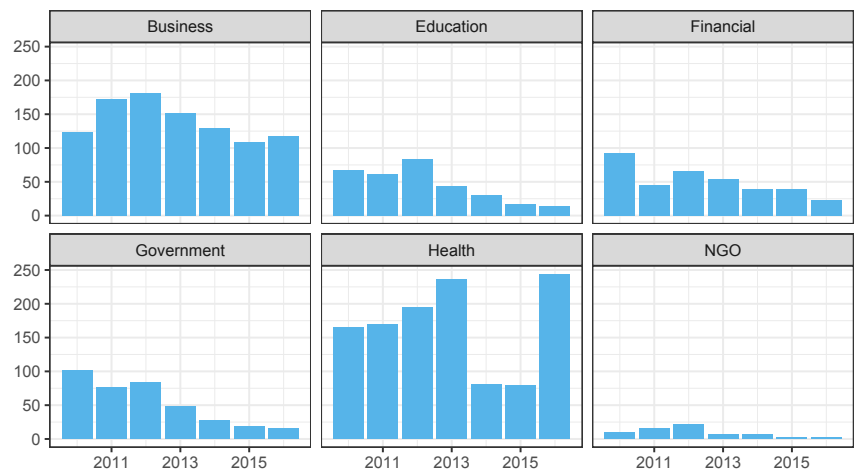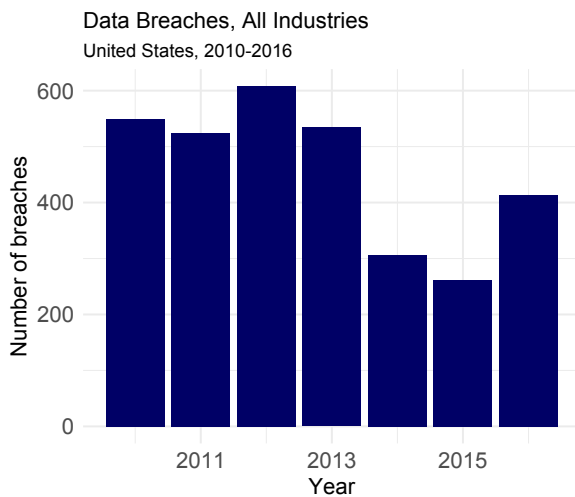
Most breaches are relatively small

Number of records lost per breach, USA, 2005-16

Number of records lost per breach, USA, 2005-16 (outliers removed)

Yahoo's two incidents from 2013

But when they're big... they're big...
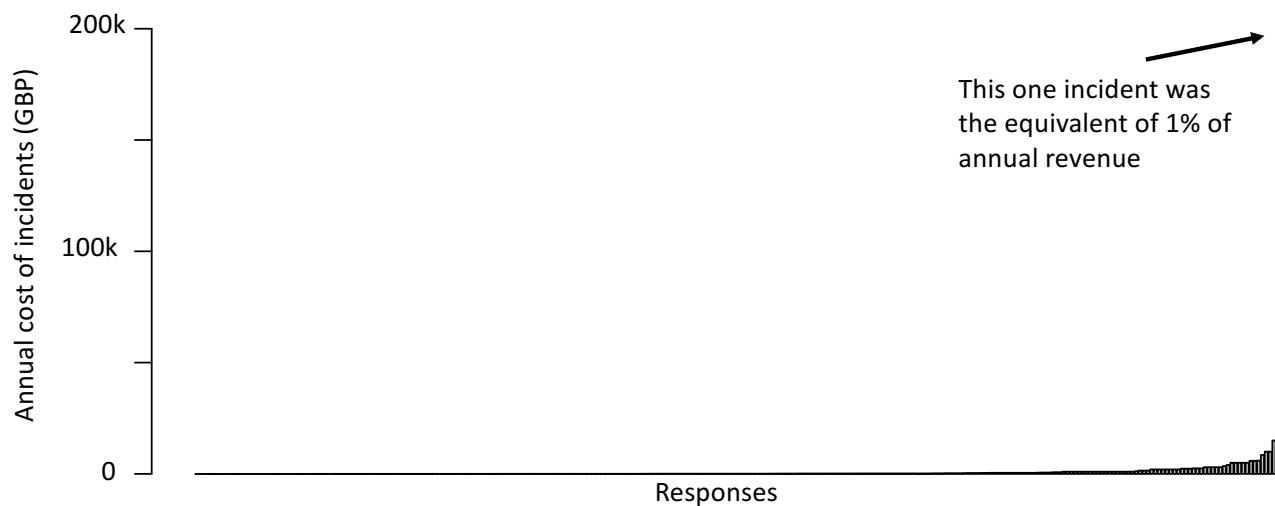# ... and getting bigger

In government, breaches are often accidental

Type of data breach, by sector, USA, 2010-2016
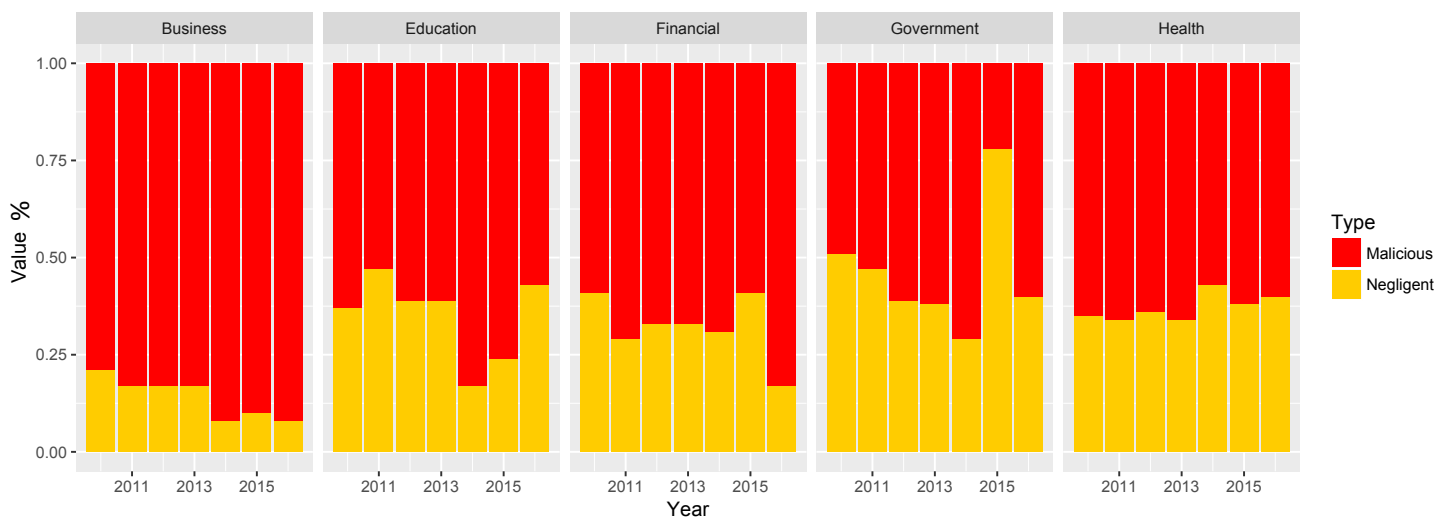
Most incidents do not directly cost much...

Annual cost of cyber incidents to all organisations that incurred costs, UK, 2017

This one incident was the equivalent of 1% of annual revenue

Annual cost of incidents (GBP)

200k

100k

0

Responses

... but big ones can cost a lot

The 'average' incident isn't the 'typical' one

Distribution of annual cost of cyber incidents to organisations that incurred costs,
by sector, UK, 2017

To Administrative & Real Estate Orgs.

To Edu, Health & Social Orgs.

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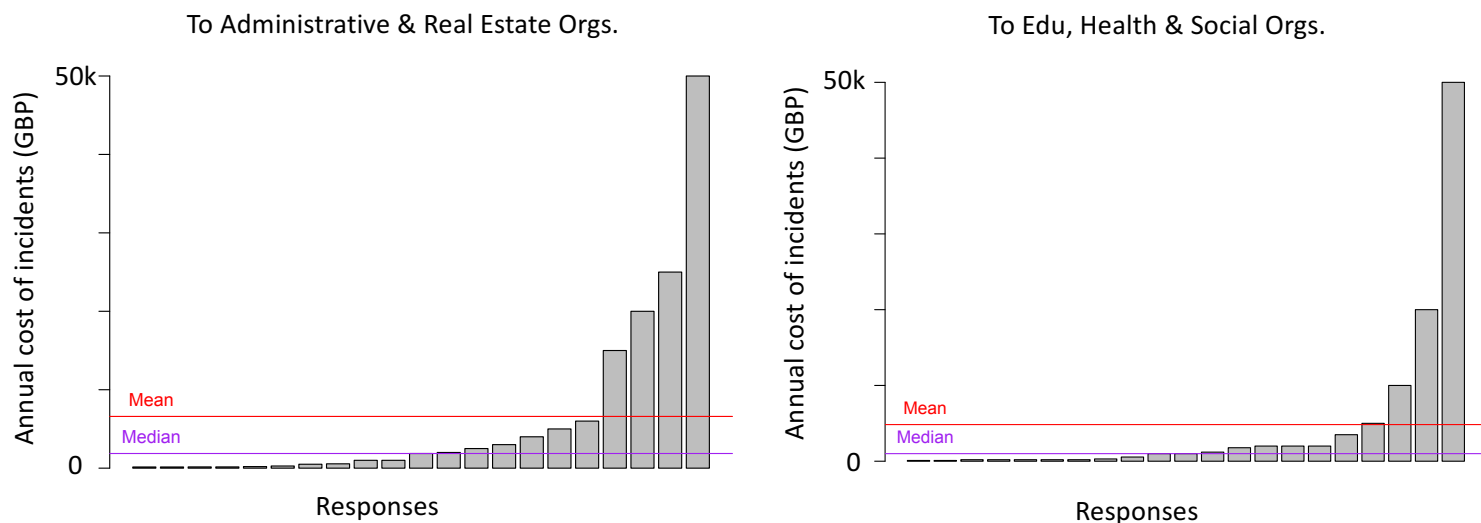
What's the future?

- GDPR is coming. . . increased liability
- The number of reported data breaches is likely to stay stable but their severity will not
- Large organisations + large data stores = large breaches

- This cyber risk analysis suggests governments should:
  - Minimize data retention, where appropriate, to reduce potential severity
  - Put controls in place to minimize probability of accidents

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