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Cyber security breaches survey 2017

Main report

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Summary

This report details the findings from a quantitative and qualitative survey with UK businesses on cyber security. The Department for Culture, Media and Sport (DCMS) commissioned the survey as part of the National Cyber Security Programme, following a previous comparable study by the Department published in 2016.[1] It was carried out by Ipsos MORI, in partnership with the Institute for Criminal Justice Studies at the University of Portsmouth, and comprised:

- a telephone survey of 1,523 UK businesses from 24 October 2016 to 11 January 2017[2]
- 30 in-depth interviews undertaken in January and February 2017 to follow up businesses that participated in the survey.

Code of practice for Official Statistics

The Cyber Security Breaches Survey is an Official Statistic and has been produced to the standards set out in the Code of Practice for Official Statistics.

Acknowledgements

Ipsos MORI and DCMS would like to thank all the businesses and individuals who agreed to participate in the survey and those that provided an input into the survey's development. We would also like to thank the organisations who endorsed the fieldwork and encouraged businesses to participate, including the Association of British Insurers (ABI), the Confederation of British Industry (CBI), the Federation of Small Businesses (FSB), ICAEW and techUK.

Main findings

Businesses increasingly see cyber security as an important issue

The 2017 survey again highlights that virtually all UK businesses covered by the survey are exposed to cyber security risks. Since 2016, the proportion with websites (85%) or social media pages (59%) has risen (by 8 and 9 percentage points respectively), as has the use of cloud services (from 49% to 59%). This year's survey also establishes that three-fifths (61%) hold personal data on their customers electronically.

In this context, three-quarters (74%) of UK businesses say that cyber security is a high priority for their senior management, with three in ten (31%) saying it is a *very high* priority. The proportion noting it as a *very low* priority is lower than in 2016 (down from 13% to just 7%) – a change mainly seen among the micro and small business population.[3]

[1] See https://www.gov.uk/government/publications/cyber-security-breaches-survey-2016 for the Cyber Security Breaches Survey 2016.

[2] This excludes sole traders, as well as agriculture, forestry and fishing businesses, and mining and quarrying businesses, which were outside the scope of the survey. The data is weighted to be representative of UK businesses by the remaining sizes and sectors.

[3] Micro businesses are those with 2 to 9 employees, small businesses those with 10 to 49 employees, medium businesses those with 50 to 249 employees, and large businesses those with 250 employees or more.

The survey highlights a range of factors that drive home the importance of cyber security for businesses, including:

- the specific threat of ransomware, which has underscored the value of any electronic data that businesses hold, not just personal or financial data
- having a senior individual in charge of cyber security – someone who can have direct contact with senior managers and can influence decision-making within the business
- board members being educated on the topic, enabling them to share knowledge and best practice across the different businesses they are involved in
- people being more exposed to cyber attacks, such as phishing scams, in their personal lives.

More businesses could still seek information or take further action to protect themselves

Three in five (58%) businesses have sought information, advice or guidance on the cyber security threats facing their organisations over the past year. The top specific sources of information mentioned are external security or IT consultants (32%) as well as online searches (10%). Only 4 per cent mention Government or other public sector sources, reflecting that awareness of the information and guidance offered by Government remains relatively low.

Despite this, three-quarters (75%) of those consulting Government sources say they found this material useful. The qualitative survey also shows once again that businesses tend to look to the Government as a trusted source to provide or signpost to information and guidance.

As in 2016, the majority of businesses (67%) have spent money on their cyber security, and this again tends to be higher among medium firms (87%) and large firms (91%).

Half of all firms (52%) have enacted basic technical controls across the five areas laid out under the Government-endorsed Cyber Essentials scheme.[4] Three-fifths (57%) have also attempted to identify cyber security risks to their organisation, for example through health checks or risk assessments (up from 51% in 2016). However, as in 2016, a sizable proportion of businesses still do not have basic protections or have not formalised their approaches to cyber security:

- Under two-fifths have segregated wireless networks, or any rules around encryption of personal data (37% in each case).
- A third have a formal policy that covers cyber security risks (33%), or document these risks in business continuity plans, internal audits or risk registers (32%).
- A third (29%) have made specific board members responsible for cyber security.
- A fifth (20%) of businesses have had staff attend any form of cyber security training in the last 12 months, with non-specialist staff being particularly unlikely to have attended.
- One-fifth (19%) are worried about their suppliers' cyber security, but only 13 per cent require suppliers to adhere to specific cyber security standards or good practice.

[4] These five areas include boundary firewalls and internet gateways, secure configurations, user access controls, malware protection, and patch management. See https://www.cyberaware.gov.uk/cyberessentials/.

- One in ten (11%) have a cyber security incident management plan in place.

All kinds of businesses continue to suffer from cyber security breaches with significant financial implications, but the reporting of breaches remains uncommon

Just under half (46%) of all UK businesses identified at least one cyber security breach or attack in the last 12 months. This rises to two-thirds among medium firms (66%) and large firms (68%).

Overall, businesses that hold electronic personal data on customers are more likely than average to have had breaches (51% versus 46%). Nonetheless, breaches are still prevalent among organisations whose senior managers consider cyber security a low priority (35%), and in firms where online services are not at all seen as core to the business (41%).

The most common types of breaches are related to staff receiving fraudulent emails (in 72% of cases where firms identified a breach or attack). The next most common related to viruses, spyware and malware (33%), people impersonating the organisation in emails or online (27%) and ransomware (17%). This highlights how, as well as having good technical measures in place, the awareness and vigilance of all staff are important to a business's cyber security.

The typical business is likely to only experience a handful of breaches in the space of a year, but a minority suffer considerably more. Across those that detected breaches, over a third (37%) report only being breached once in the year, but the same proportion say they were breached at least once a month, with 13 per cent saying it was daily. Moreover, in the last year, the average business identified 998 breaches – a figure pushed up by the minority of businesses that experience hundreds or thousands of attacks in this timeframe.

Not all breaches and attacks have material outcomes that affect the business. Nonetheless, four in ten (41%) businesses who identified a breach in the last 12 months – or a fifth (19%) of all UK businesses – report an outcome from cyber security breaches, such as a temporary loss of files or network access (23%) or systems becoming corrupted (20%). Six in ten (57%) of those who identified breaches also say the breach adversely impacted their organisation, for example through being forced to implement new protective measures (38%) or having staff time taken up dealing with the breach (34%).

Breaches frequently result in a financial cost to the business. Among the 46 per cent of businesses that detected breaches in the last 12 months, the survey finds that the average business faces costs of £1,570 as a result of these breaches. As in 2016, this is much higher for the average large firm, at £19,600, though the average medium firm (£3,070) and micro and small firms (£1,380) also incur sizeable costs.

Despite this, external reporting of breaches remains uncommon. Only a quarter (26%) reported their most disruptive breach externally to anyone other than a cyber security provider. The findings suggest that some businesses lack awareness of who to report to, why to report breaches, and what reporting achieves. Subsequent surveys will track whether reporting becomes more commonplace as businesses become increasingly aware of their cyber security risks and obligations.

1 Introduction

1.1 Background and objectives

The National Cyber Security Strategy 2016–2021[5] outlines the Government's aim to make the UK secure and resilient to cyber threats, so it continues to be prosperous and confident in a digital world. As part of this, UK businesses need to comprehend the nature and significance of the threats they face. This latest Cyber Security Breaches Survey was run to help businesses understand what other similar businesses are doing to stay cyber secure, and supports the Government to shape future policy in this area.

The survey builds on the findings first established in the 2016 survey[6] and covers:

- business awareness and attitudes towards cyber security
- approaches to cyber security, including estimates of business spending
- the nature and impact (including estimated costs) of cyber security breaches
- differences by size, sector and region.

1.2 Methodology

There were two strands to this survey:[7]

- A random probability telephone survey of 1,523 UK businesses was undertaken from 24 October 2016 to 11 January 2017. The survey data has been weighted to be statistically representative of the UK business population by size and included sectors.

- A total of 30 in-depth interviews were undertaken in January and February 2017 to follow up with businesses that had participated in the survey and gain further qualitative insights.

Sole traders and public sector organisations were outside the scope of the survey, so were excluded. In addition, businesses with no IT capacity or online presence were deemed ineligible, which meant that a small number of specific sectors (agriculture, forestry, fishing, mining and quarrying) were excluded.

1.3 Interpretation of findings

How to interpret the survey data

The survey results are subject to margins of error, which vary with the size of the sample and the percentage figure concerned. For all percentage[8] results, subgroup differences by size, sector and region,

[5] See https://www.gov.uk/government/publications/national-cyber-security-strategy-2016-to-2021.

[6] See https://www.gov.uk/government/publications/cyber-security-breaches-survey-2016 for the Cyber Security Breaches Survey 2016.

[7] More technical details and a copy of the questionnaire are available in the separately published Annex, available on the gov.uk website at: https://www.gov.uk/government/statistics/cyber-security-breaches-survey-2017.

[8] Where subgroup mean scores are compared, the large variation in the data often means that these differences are not statistically significant – this is made clear throughout. However, looking at the pattern of mean scores across subgroups can still generate valuable insights in these instances.

as well as changes since the 2016 survey, have been highlighted only where statistically significant (at the 95% level of confidence).[9] In charts, arrows (⬆⬇) are used to highlight significant changes since 2016 (where comparison is feasible). There is a further guide to statistical reliability at the end of this report.

Analysis by size splits the sample into micro businesses (2 to 9 employees), small businesses (10 to 49 employees), medium businesses (50 to 249 employees) and large businesses (250 employees or more). Where there are also differences by business turnover, this is commented on separately.

Due to the relatively small sample sizes for certain sectors, these have been grouped with other similar sectors for more robust analysis. Groupings referred to across this report are as follows:

- administration or real estate
- construction
- education, health or social care
- entertainment, service or membership organisations
- finance or insurance
- food or hospitality
- information, communications or utilities
- manufacturing
- professional, scientific or technical
- retail or wholesale
- transport or storage.

Where figures in charts do not add to 100% this is due to rounding of percentages or because the questions allow more than one response.

How to interpret the qualitative data

The qualitative findings offer more nuanced insights and case studies into how and why businesses hold attitudes or adopt behaviours with regards to cyber security. The findings reported here represent common themes emerging across multiple interviews. However, they are not intended to be statistically representative.

[9] Subgroup differences highlighted are either those that emerge consistently across multiple questions or evidence a particular hypothesis (i.e. not every single statistically significant finding has been commented on).

2 Profiling UK businesses

This chapter sets out businesses' exposure to cyber security risks. These risks can come about via their reliance on digital services and e-commerce, use of cloud computing, and use of personal devices in the workplace (bringing your own device, or BYOD). It provides the context for the different attitudes and approaches to cyber security evidenced in later chapters.

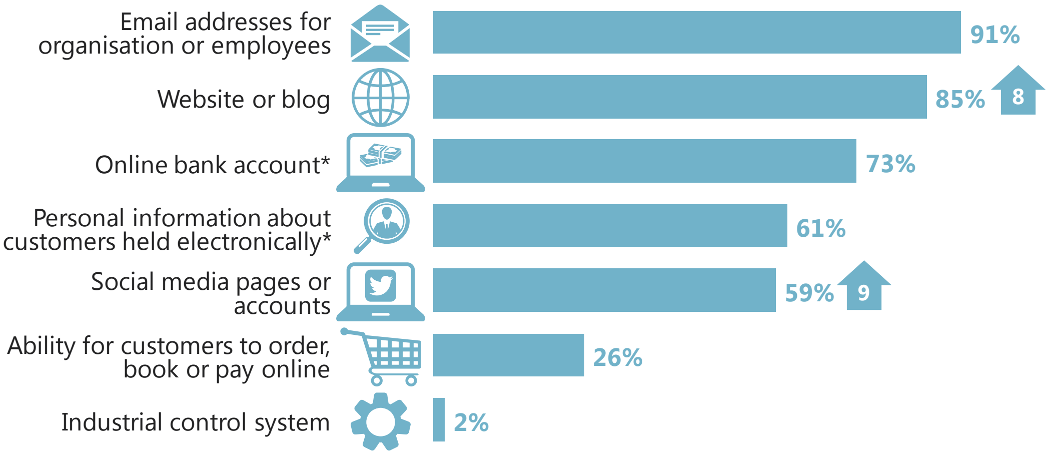
2.1 Online exposure

As can be seen in Figure 2.1, virtually all UK businesses covered by the survey employ online services in some form (99%). Across all size bands, emails are the most widely used of the services asked about, with a large majority also having a website, online bank account and a social media page. The number of businesses having an online presence through websites or social media has also significantly risen since the 2016 survey, and social media pages remain especially common among medium firms (71%) and large firms (78%).

As might be expected, industrial control systems are also most prevalent among large firms (11% report having these in place).

Figure 2.1: Businesses' reliance on online services

Q. Which of the following, if any, does your organisation currently have or use?



Base: 1,523 UK businesses
*New or amended answer options not present in last year's survey

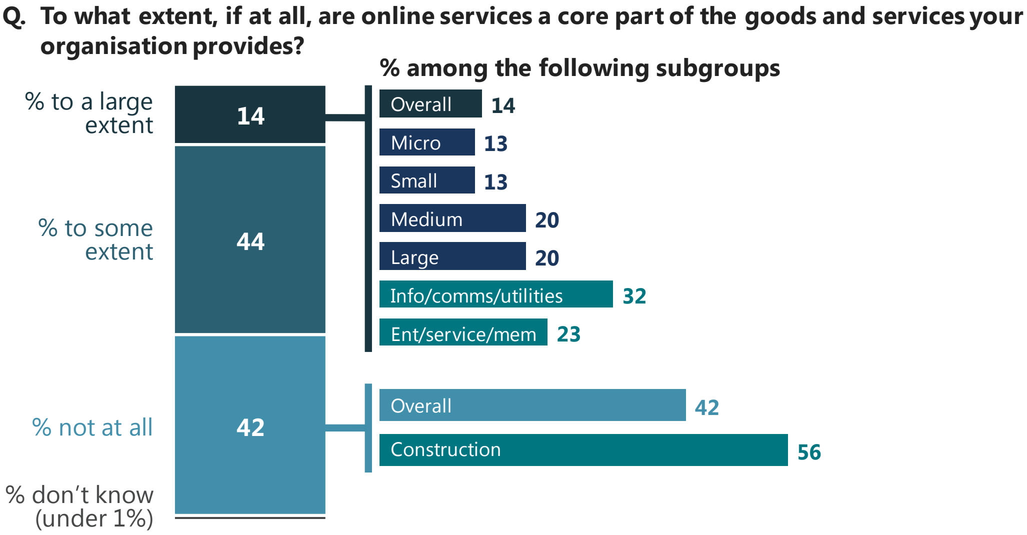
Which businesses consider themselves to be online businesses?

Around three in five businesses consider online services to be a core part of their offering, at least to some extent. As Figure 2.2 shows, 14 per cent say this is to a large extent, and this is higher among businesses in the information, communication or utilities sectors and among entertainment, services or membership firms.

Over two in five businesses do not consider online services as core to their business, in line with last year. Also in line with the 2016 survey, firms in the construction sector are more likely than others to think that online services are not a core part of their business offer (56%).

Whilst most businesses of all sizes use a variety of online services, the extent to which they consider themselves as online businesses varies by size band. As Figure 2.2 indicates, micro and small firms are much less likely to view online services as core to their business than medium and large firms.

Figure 2.2: Businesses that consider online services as core to their business offer



Bases: 1,502 UK businesses; 494 micro firms; 476 small firms; 361 medium firms; 171 large firms; 138 information, communications or utilities firms, 86 entertainment, services or membership firms; 82 construction firms

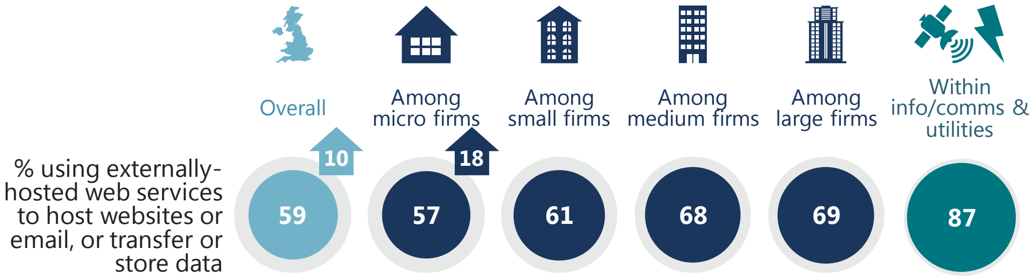
Organisations are more likely to see themselves as online businesses once they accept online payments, bookings and orders (28% to a large extent, versus 14% overall). It is notable, however, that 15 per cent of businesses with online payment booking and order facilities still think online services are not at all core to their business, and therefore may underestimate cyber security as an issue for them.

2.2 Cloud computing

The use of cloud computing is increasingly widespread among UK businesses, with 59% of businesses using some sort of externally-hosted web service (a 10 percentage point increase since 2016). Micro businesses in particular have seen a significant increase from 39% in 2016 to 57% in this year's survey. Among all size bands, a majority of businesses are now using these services, as Figure 2.3 highlights.

Cloud computing is still less commonly used in the construction sector (48%) and the transport or storage sectors (43%).

Figure 2.3: Usage of externally-hosted web services



Bases: 1,523 UK businesses; 506 micro firms; 479 small firms; 363 medium firms; 175 large firms; 140 information, communications or utilities firms

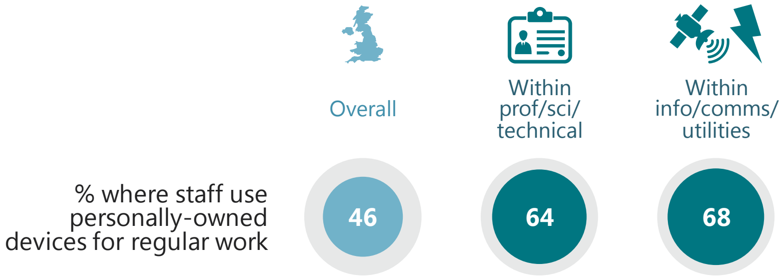
Among businesses who use externally-hosted web services:

- Three in five (60%) say that they store commercially confidential information on the cloud (this rises to 69% in the finance or insurance sectors).
- Over half (55%) store at least some personal data relating to customers, staff or suppliers on the cloud (increasing to 67% in the finance or insurance sectors).

2.3 Use of personal devices

Over two-fifths (46%) of businesses are exposed to the cyber security risks of BYOD. This is more prevalent in medium-sized organisations (56%), as well as firms in the information, communications or utilities sectors (68%) and professional, scientific or technical services (64%) sectors, as Figure 2.4 shows.

Figure 2.4: Businesses where bringing your own device (BYOD) occurs



Bases: 1,523 UK businesses; 126 professional, scientific or technical service firms; 140 information, communications or utilities firms

It is also noteworthy that firms who consider online services to be core to their business to a large extent are also those where BYOD is more prevalent (57%, versus 46% overall). This means that businesses who are perhaps more exposed to cyber security risks related to BYOD could also have the most to lose from a significant BYOD related breach. This is a particularly important issue for the information, communications or utilities sectors to address, as this sector has both a higher-than-average reliance on online services, and a higher prevalence of BYOD.

3 Business awareness and attitudes

The remainder of this report looks in much more detail at how businesses of different sizes and sectors, and with varying use of online services, deal with cyber security. It includes qualitative case studies to show how and why certain businesses' attitudes and approaches have evolved over time.

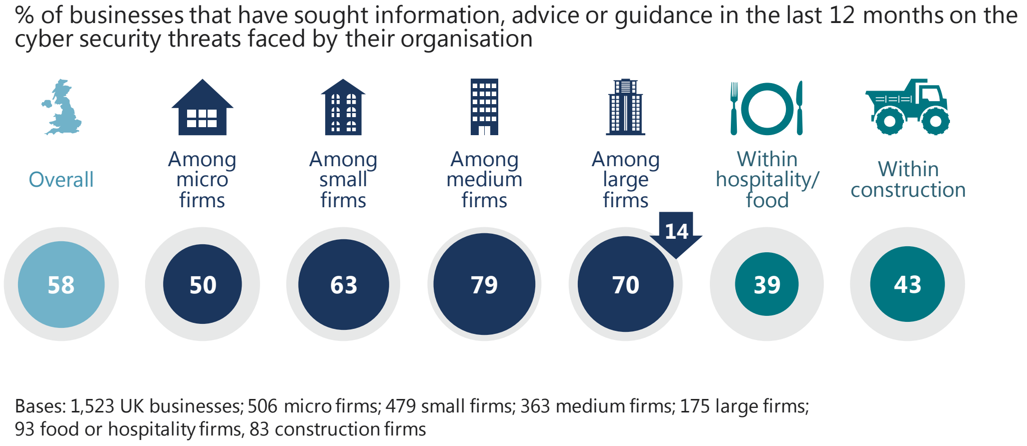
This chapter first looks at where businesses get information, advice or guidance about cyber security, and their perceptions of the support available. It also covers attitudes towards cyber security, and the factors underpinning these attitudes.

3.1 Sources of information

Three in five (58%) businesses have sought information, advice or guidance on the cyber security threats facing their organisations over the past year. As Figure 3.1 shows, there is still a substantive discrepancy between micro businesses and others, with the former much less likely to have sought out anything. Businesses in the food or hospitality and construction sectors are also less likely than average to have searched for material.

While these findings are in line with 2016 overall, large businesses specifically are less likely to have sought material this time round. In particular, large businesses are much less likely to have used external IT or cyber security consultants or providers as an information source (down from 45% to 34% this year) – despite being just as likely as last year to use outsourced security providers (see section 4.2).

Figure 3.1: Whether businesses have sought information, advice or guidance



Just as in 2016, the top specific (unprompted) sources of information are external security or IT consultants (32%) as well as Google or general online searching (10%). Seeking information from Government or other public sector sources such as the police or regulators remains uncommon, with just four per cent mentioning any such sources. However, it should be noted that this year's survey was conducted before the February 2017 launch of the National Cyber Security Centre, and just after the Centre's website was published in October 2016. The intention of the new Centre and its website is to make cyber security guidance more accessible and easy to use for businesses. In future, more businesses may start to use the range of guidance it provides.[10]

Large businesses are more likely than others to use Government or other public sector sources (16%), but even among this subgroup the Government is still an uncommon information source. Medium businesses are more likely than average to have sought information via external security consultants or providers (46%, versus 32% overall) as well as from trade associations (8% versus 3%).

Businesses in two specific sectors are also more likely to have sought information from trade associations. These are finance or insurance businesses (8% from trade associations) and information, communications or utilities businesses (11%).

Finance or insurance businesses are also more likely than others to have sought material on this topic from their regulator (8%, versus virtually no mentions across other sectors).

The importance of trade associations and sector-specific regulators also emerged in the qualitative survey. Some businesses noted that they expected their trade association or regulator to keep them in the loop if there were any important requirements to adhere to on cyber security, so they did not necessarily expect to have to actively search for this information and guidance. They also expected these sources to tailor guidance more to their sector, so anything coming from them would be more relevant. In another example, one investment business expected information and guidance on cyber security to come from the Financial Conduct Authority (FCA), because they had seen this kind of guidance being issued frequently by the Securities and Exchange Commission in the US (the equivalent of the FCA).

"There's some information that comes through from the FCA, but I think it's quite limited in terms of cyber security. As a regulated firm the FCA is always my first port of call … You'd expect it to be more tailored to the financial industry."
Small business

Trust in information

In the qualitative interviews, one set of participants – typically those in specialist IT roles – were more confident in navigating across the range of information and guidance available. Many had looked at a range of sources to keep themselves up to date, including going on conferences and training, looking at specialist forums and talking regularly to paid IT consultants or auditors. By contrast, non-specialists had much more limited exposure to information, and some had based their understanding of cyber security just on media stories, on cyber security issues they had experienced in their non-business lives, or simply on the information and guidance they got from their outsourced provider.

The latter group were often less confident in assessing what they saw, and a lack of trust in information emerged as an important theme in the qualitative survey, particularly when judging the trustworthiness of security providers trying to sell them products. While the IT specialists interviewed felt they had the technical knowledge to judge the merits of these products for themselves, businesses where non-IT staff

[10] Businesses can find guidance on the National Cyber Security Centre's website, at: https://www.ncsc.gov.uk/guidance.

oversaw cyber security specifically wanted more Government signposting to trusted information and guidance sources online. They also wanted more general guidance on the types of questions they should be asking security providers to judge their quality. Without this knowhow, some businesses simply took the advice from their providers for granted, or had to employ IT consultants to help them filter advice.

"People will tell you anything in this industry to get you to buy something … You need to look for things they don't tell you rather than the things they do."
Large business

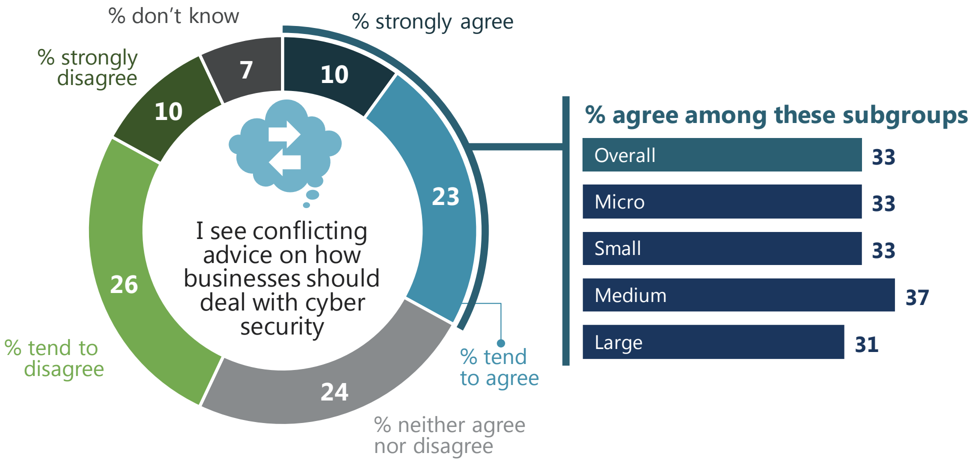
Among the small proportion of businesses who say they have actively sought information, advice or guidance from Government sources, it is worth noting that three-quarters (75%) found this material useful, and a quarter (26%) say it was very useful. As explained in section 3.2, it is most likely lack of awareness rather than a lack of perceived relevance or usefulness that explains why so few businesses have used Government information or guidance on this topic to date.

Conflicting advice

Figure 3.2 shows that a third (33%) of businesses think there is conflicting advice on cyber security, but a similar proportion (36%) disagree. In other words, it is currently a minority of businesses that think conflicting advice is a problem. This is a common finding across size bands and sectors. Amongst businesses that have actively sought information, advice or guidance, the proportion that think there is conflicting advice is closer to two-fifths (37%) but again an equal proportion disagree (37%).

Figure 3.2: Business perceptions of conflicting advice

Q. How much do you agree or disagree with the following statement?



Bases: 1,523 UK businesses; 506 micro firms; 479 small firms; 363 medium firms; 175 large firms

The qualitative survey found that conflicting advice was not the main problem businesses felt they faced when navigating cyber security information and advice. Those who were IT specialists noted that there was inevitably a conflicting view over the technical aspects, but that the basic advice around what the general user should do was consistent. Those who were non-specialists also did not tend to feel there was conflicting advice, and noted more the overall lack of advice that they had received on the topic.

A more substantive problem that businesses felt their non-specialist staff faced was around a lack of tailored or specific advice. One finance firm wanted more specific advice to give to their staff on the latest phishing emails that they might expect to get in their sector, while another firm of solicitors noted that advice around avoiding scams was sometimes too broad, and should simply tell staff to ignore, for example, all emails and calls purporting to be from organisations like Microsoft.

Case study: presenting unchecked advice to senior managers

Unchecked advice can cause problems for businesses when presenting options to senior managers. One small business offering dance classes had received conflicting advice about whether cloud-based storage would be more or less secure than their current set-up. One of their board members specialised in data protection, and had challenged the initial advice they had been given around this. The finance manager was now having to do more of their own research to establish the best option for the business. This involved talking again to the board member, looking through Government guidance and searching online generally for more information.

"I'll ask the board member, look at some governmental guidelines, and I'm likely to just Google."

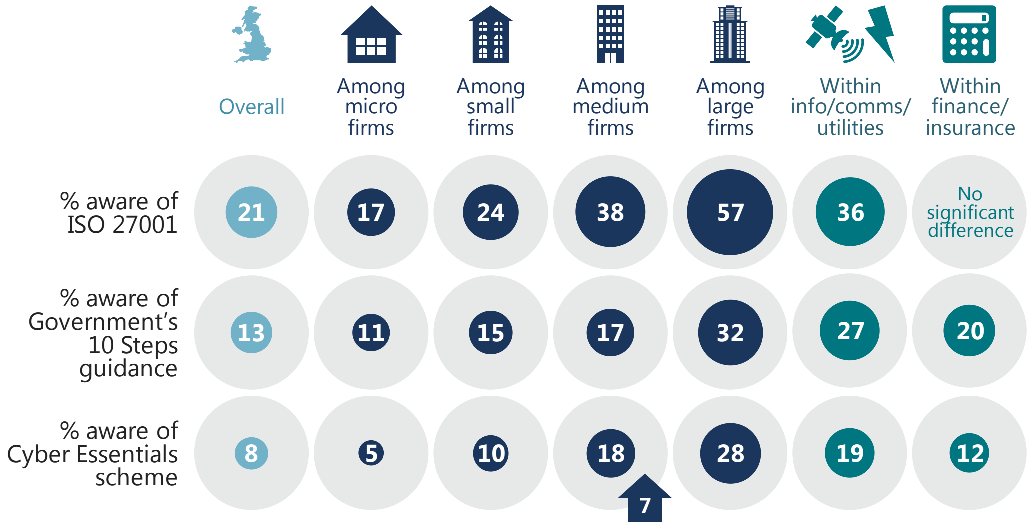
3.2 Awareness of Government initiatives and other standards

Last year's survey found that accreditation schemes and standards relating to cyber security are not widely known in the business community. This year's findings show a similar situation. With regards to Cyber Essentials, the low awareness of the scheme evidenced here also echoes the findings of the 2016 process evaluation report into the scheme, which suggested that in many cases businesses only became aware of Cyber Essentials and engaged with it in instances where it was a mandatory requirement (for example when working as a Government supplier).[11]

As Figure 3.3 indicates, awareness of such standards continues to be much higher among large firms, and is also higher than average among finance or insurance businesses, and information, communications or utilities businesses.

[11] See https://www.gov.uk/government/publications/cyber-essentials-scheme-research.

Figure 3.3: Business awareness of cyber security initiatives and standards



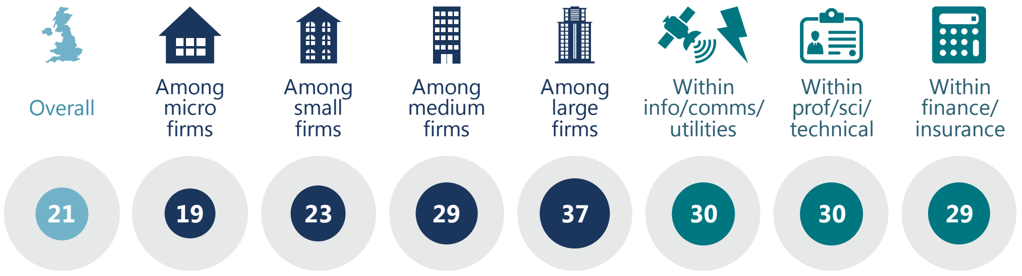
	Overall	Among micro firms	Among small firms	Among medium firms	Among large firms	Within info/comms/ utilities	Within finance/ insurance
% aware of ISO 27001	21	17	24	38	57	36	No significant difference
% aware of Government's 10 Steps guidance	13	11	15	17	32	27	20
% aware of Cyber Essentials scheme	8	5	10	18	28	19	12

Bases: 1,523 UK businesses; 506 micro firms; 479 small firms; 363 medium firms; 175 large firms; 140 information, communications or utilities firms; 350 financial or insurance firms

Figure 3.4 shows that there is greater awareness across all sizes of business of the Government's Cyber Aware campaign (formerly known as Cyber Streetwise) than there is of the 10 Steps guidance or Cyber Essentials scheme (the two other major Government cyber security initiatives). Among those aware of this campaign, a quarter (23%) are also aware of Cyber Essentials and a third (31%) are aware of the 10 Steps. This suggests that Cyber Aware could be an effective brand or platform to signpost businesses to these other initiatives.

Figure 3.4: Business awareness of the Cyber Aware campaign

% of businesses that have seen or heard of the Government's Cyber Aware campaign



Overall	Among micro firms	Among small firms	Among medium firms	Among large firms	Within info/comms/ utilities	Within prof/sci/ technical	Within finance/ insurance
21	19	23	29	37	30	30	29

Bases: 1,523 UK businesses; 506 micro firms; 479 small firms; 363 medium firms; 175 large firms; 140 information, communications or utilities firms; 126 professional, scientific or technical services firms; 350 financial or insurance firms

Awareness of the Data Protection Act 1998 and the General Data Protection Regulation

From 25 May 2018, the General Data Protection Regulation (GDPR) will supersede the Data Protection Act 1998 in the UK. On taking effect, this change will widen the definition of what constitutes personal data. Businesses will also face new requirements in terms of preventing and reporting data breaches, as well as tougher penalties for breaches. Businesses can find specific guidance on how to prepare for the GDPR on the Information Commissioner's Office website.[12]

The qualitative survey explored awareness and understanding of the GDPR in relation to cyber security. Across almost all the businesses interviewed, there was strong awareness of the Data Protection Act 1998 and businesses were confident they complied with the current regulations. Awareness of the GDPR was much less uniform, with smaller businesses often not having heard of it. Some smaller businesses had heard of it, and felt that they would learn to comply with the new requirements when they came into force, but were not specially preparing for them before then and did not necessarily understand the cyber security implications (for instance around reporting of breaches and protection of personal data).

Larger businesses and those that regularly worked with personal data tended to be much more aware. In several cases, these businesses had started internal discussions to prepare for the new requirements. One business had specifically set up an internal working group that involved the IT team, as well as their compliance, human resources and marketing teams, so that all aspects of data protection, including the cyber security implications, were covered.

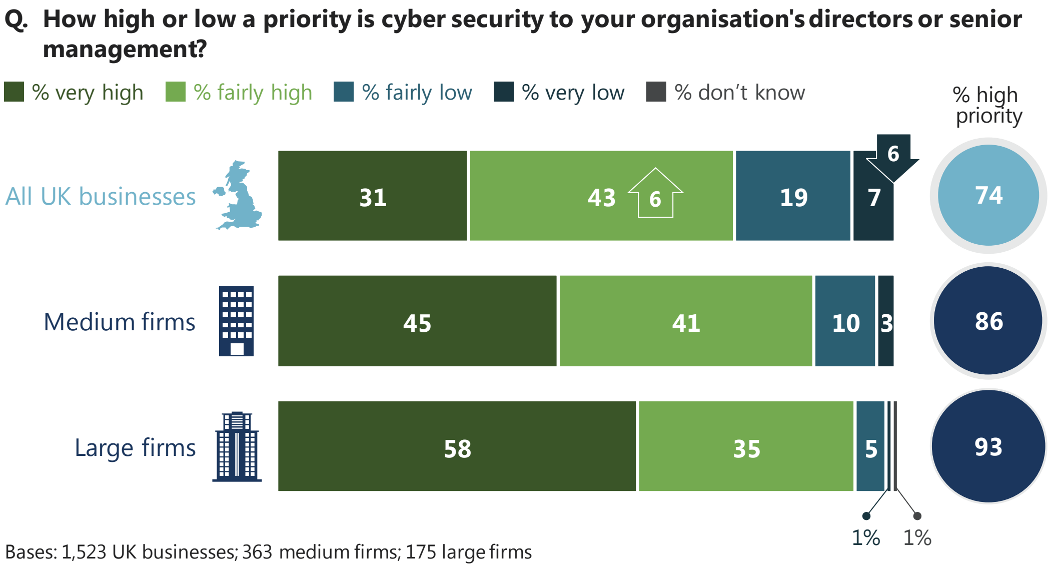
3.3 Importance of cyber security

Cyber security remains a high priority for the heads of a large majority of UK businesses. Three-quarters (74%) say it is either a very high (31%) or fairly high (43%) priority for their senior management.

As Figure 3.5 illustrates, the proportion saying cyber security is a fairly high priority has risen since 2016, and alongside this, fewer now say it is a very low priority for their senior managers (each rising and falling by 6 percentage points respectively). This change has mainly come about among micro and small businesses, whereas the figures for medium and large businesses – who were already considerably more likely to see cyber security as a high priority – are unchanged from last year. This suggests that some of the businesses who previously did not recognise cyber security as an issue at all are now becoming more alert to the risks they face.

[12] See https://ico.org.uk/for-organisations/data-protection-reform/.

Figure 3.5: Whether senior managers consider cyber security a high priority



Bases: 1,523 UK businesses; 363 medium firms; 175 large firms

Another measure of business size, turnover, does not appear to be as big a factor in prioritisation of cyber security as the number of employees. For example, senior managers in relatively high-turnover micro and small businesses (with annual sales of £2 million and over) are no more likely than average to see cyber security as a high priority. There is no clear reason behind this.

Senior managers in a range of sectors are much more likely than average to treat cyber security as a high priority, including finance or insurance (90%), professional, scientific or technical firms (86%), information, communications or utilities (85%). Those in the construction (67%), administration or real estate (67%), transport or storage (67%), and food or hospitality (56%) sectors are all less likely than average to view it as a high priority. As is documented throughout the rest of this report, these tend to be the sectors that have taken more or less action respectively around cyber security, in line with the overall attitudes of their senior management teams.

Reasons for prioritising or deprioritising cyber security

Where businesses say cyber security is a low priority for their senior managers, the main reason given for this is a sense that it is not relevant to their organisation (37%) – in line with the 2016 survey. Nonetheless, three in ten (29%) of the businesses giving this reason also say they have had a breach or attack within the last 12 months, highlighting that their risk perception may be different from the reality.

Other common reasons (all unprompted) centre around businesses thinking they have nothing of value to attackers. Three in ten of those who say it is a low priority for senior management say this is because they do not have online services (29%) and two in ten feel they have nothing worth breaching (22%).

Lack of value attached to data was also a common theme in many of the qualitative interviews. Businesses who did not hold customers' bank details or other personal data often struggled to understand why their electronic data would be sought by anyone outside the business, so not considering themselves at risk.

"We keep electronic records of orders. I keep addresses and contact numbers. I do not keep any card information on my system … so I don't think cyber attacks are much of a risk."
Medium business

"At the moment we're not in danger. We don't have anything of value."
Micro business

However, other businesses challenged this notion, highlighting that the specific threat of ransomware meant that all electronic data has become valuable. Some businesses felt this threat had helped to raise the profile of cyber security. One business noted that ransomware had made it easier to show senior managers the potential scale of the threat if multiple devices could be incapacitated, and to move business attitudes away from the stereotype of bedroom hackers, to focus more on criminal activity. Another IT manager at a civil engineering business said that they would use the two ransomware attacks they had faced to encourage the business to invest in new security software.

"Ransomware is an easy thing to communicate to people, because you can show it working, and most people can get the scaling factor of it – if this gets on my machine, then gets on 200 more machines, gets on all the systems – it brings it home for a lot of people."
Medium business

In the survey, lack of awareness of cyber security as an issue, or simply not having considered it before, are not big reasons overall for deprioritising the issue – just 14 per cent mention these. However, these are notably more common reasons given by medium and large organisations (41% of those with over 50 staff mention these). This indicates that, within these larger businesses, lack of attention paid to cyber security is very often simply the result of senior management boards lacking awareness of the issue.

Moreover, the qualitative survey highlighted the added value of board members being involved in cyber security. One finance business noted that several of their directors also sat on the boards of other businesses within the finance industry and shared best practice across these businesses. In their view, this helped to raise standards across the industry because there was pressure from board members to be as secure as other similar businesses.

"We have a very supportive board of directors who are also quite educated in regards to what other fund managers or law firms are doing. One of the directors is a professional director so he sits on numerous boards … So there's an open dialogue. Themes and trends are discussed, and areas in IT are highlighted that we need to improve."
Small business

The qualitative survey also established several other reasons, in addition to ransomware threats and board involvement, for prioritising (or deprioritising) cyber security:

- Smaller businesses that were largely offline in their day-to-day work, such as commercial mechanics or in one case a nursery, felt that losing IT functions would not stop them from carrying out their work and that because of their business area, there was no expectation from customers that they would prioritise cyber security. For example, the mechanic noted that there was a bigger reputational risk from fitting a bad engine than from getting hacked.

"Cyber security is one of the senior managers' lowest concerns. It's less concerning than physical problems, like engines breaking. That's costing them money so they want to address that, whereas this isn't costing us anything."
Medium business

- Wider business culture (also discussed again later in this section) was important. Mirroring findings from last year, the strong confidentiality cultures in certain sectors, such as those working with vulnerable groups, complemented the focus on cyber security. On the other hand, one insurance broker business had a much more high-risk culture where senior managers tended to take a very reactive approach to cyber security. The IT lead suggested that senior managers would not invest in preventative measures the IT lead had recommended, because they felt the business should just absorb the risk rather than spend money.

- The relative seniority of those placed in charge of cyber security mattered. In businesses where the cyber security brief was held by a junior staff member or middle manager, they would typically have less time face-to-face with the senior managers or board, which meant the board was less exposed to the issues and risks. These individuals also felt they had less influence over senior management decision-making and that their senior managers did not necessarily understand the consequences of their actions around cyber security.

- Greater exposure in people's personal lives to phishing scams had helped drive up awareness of cyber security among staff.

Case Study: senior managers ignoring cyber security advice

In one large civil engineering firm, the IT department had issued advice warning staff not to map network drives to their local laptops. One department head and another senior manager had ignored this advice and had later inadvertently downloaded a ransomware virus to a local laptop with the mapped network drive. The attack was not aimed at getting any particular data, but was just done to extract money from the business. The mapping allowed the virus to spread across the whole server, rather than just being isolated to the single device.

"They were looking purely to hold us to ransom and get as much money as they could."

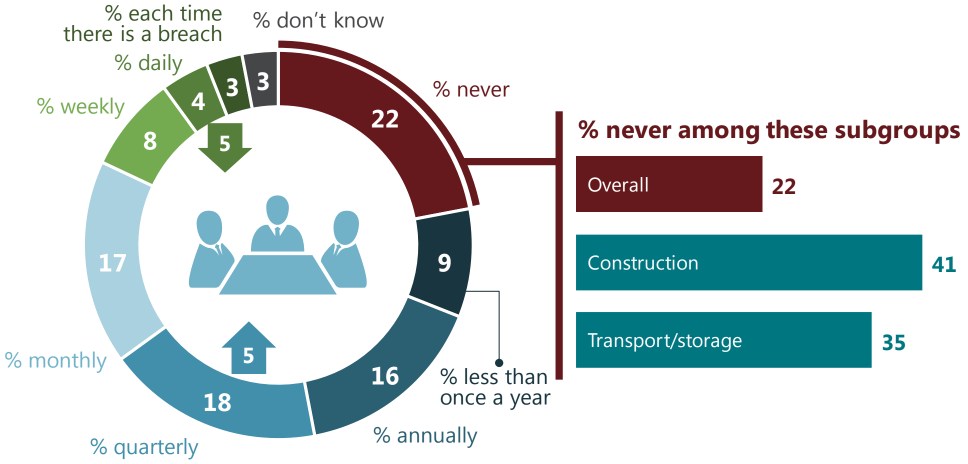
The backup files from Microsoft were only restored after around one working week, meaning the business could not access files previously stored on the server during this time. The laptop had to be wiped and rebuilt from scratch. Although no data was permanently lost, there was a loss in productivity, and this alerted the organisation's senior management to the need to have better systems in place, restricting direct access to network drives for staff who do not strictly need access.

How often is senior management updated on cyber security?

In line with last year, over a fifth (22%) of organisations' senior managers are *never* given an update on cyber security issues. As Figure 3.6 shows, this senior manager involvement is particularly lacking among construction firms (41% of whom never update senior managers) and transport or storage firms (35%).

Figure 3.6: Updates given to senior management on cyber security

Q. Approximately how often, if at all, are your organisation's directors or senior management given an update on any actions taken around cyber security?



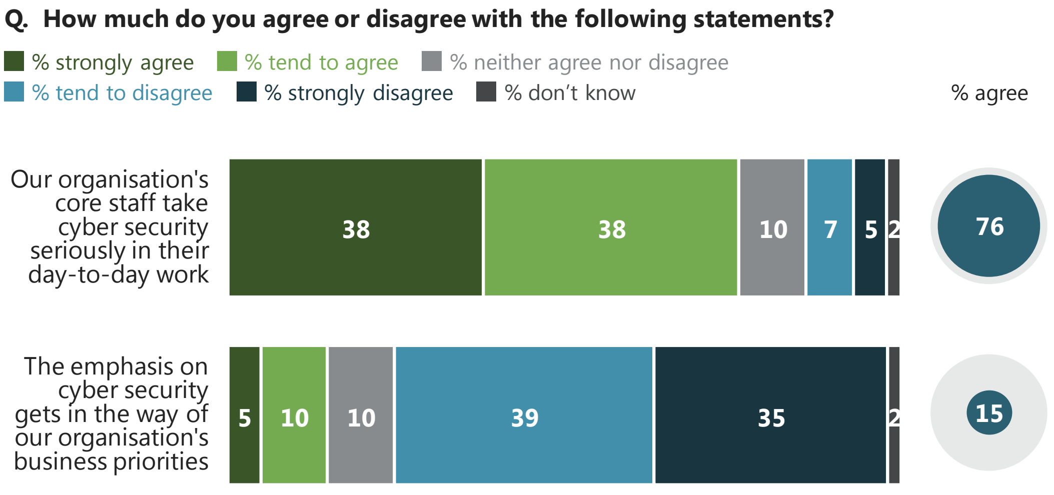
Bases: 1,523 UK businesses; 83 construction firms; 94 transport or storage firms

Wider business cultures

Figure 3.7 shows that in three-quarters (76%) of businesses, the core staff are seen to take cyber security seriously. A similar proportion (73%) disagree that cyber security gets in the way of their business priorities. Both of these findings indicate a strong culture that values cyber security across UK businesses.

Business size and turnover are not especially correlated with the perception that cyber security gets in the way of business priorities. This suggests that even very large or high turnover businesses do not necessarily think that dealing with cyber security will slow down their business.

Figure 3.7: Whether core staff take cyber security seriously and whether cyber security is perceived to disrupt other priorities



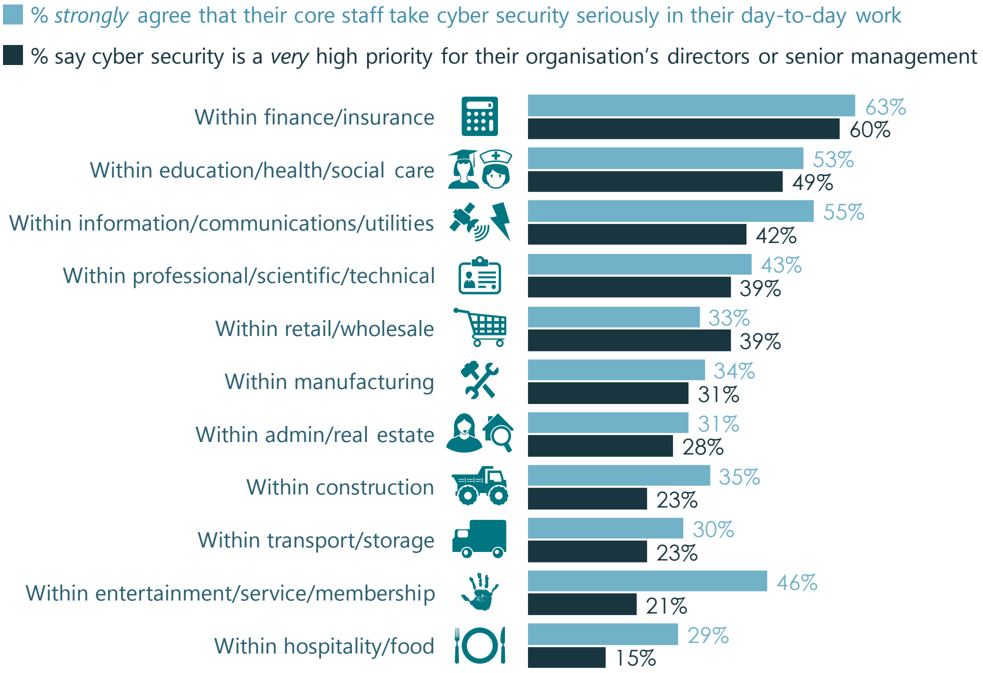
Base: 1,523 UK businesses

Organisations where senior management treat cyber security as a high priority are also more likely than average to say that their core staff take it seriously (88%, versus 76% overall). This suggests that the culture set by senior managers permeates throughout the whole organisation when it comes to cyber security, again highlighting the importance of senior managers' engagement with the topic.

At the same time, even though large firms are more likely than average to have senior managers who treat cyber security as a high priority, they are also more likely than others to *disagree* that their core staff take cyber security seriously (19%, versus 12% overall) and no more likely to agree. This highlights that, among the largest firms, activities such as training and awareness raising are especially important to bridge the perceptions gap between senior managers and the wider workforce.

Figure 3.8 shows the relative attitudes of senior management versus core staff in different sectors, as measured by these two questions. Here it can be seen that, relative to other sectors, the retail or wholesale sectors are ones where the wider core staff seem to take cyber security less seriously relative to senior management. By contrast, it is clear that the cross-workforce culture of being cyber secure is especially strong among finance or insurance businesses.

Figure 3.8: Whether core staff take cyber security seriously by sector grouping, compared with prioritisation of cyber security by senior managers



Bases: 96 administration or real estate firms; 83 construction firms; 131 education, health or social care firms; 87 entertainment, service or membership organisations firms; 350 finance or insurance firms; 93 food or hospitality firms; 140 information, communications or utility firms; 187 manufacturing firms; 126 professional, scientific or technical firms; 136 retail or wholesale firms; 94 transport or storage firms

4 Approaches to cyber security

This chapter looks at how much businesses are investing in cyber security and what drives this level of investment. It then examines how firms broach the subject of cyber security with their staff, and the policies and procedures they have in place to identify and reduce risks.

4.1 Investment in cyber security

Levels of investment

Table 4.1 shows that, as per last year, two-thirds of all firms continue to have some level of cyber security spend.[13] This again varies by size, with larger organisations tending to spend more.[14] Looking at median spend figures, the typical micro or small business tends to spend a very small sum, just over what an annual subscription to antivirus or anti-malware software might cost, while the typical large firm spends at a level more akin to an individual's annual salary.

Once more, the variation in spending is much higher among large firms than others. This is likely to reflect the considerable sector differences shown later in Figure 4.1, with the largest firms having the capacity and choice to spend very large or relatively small amounts on cyber security.

Table 4.1: Average investment in cyber security in last financial year

	All businesses	Micro/small[15]	Medium	Large
Mean spend	£4,590	£2,600	£15,500	£387,000
Median spend	£200	£200	£5,000	£21,200
% spending £0	33%	34%	13%	9%
Base	1,209	829	268	112

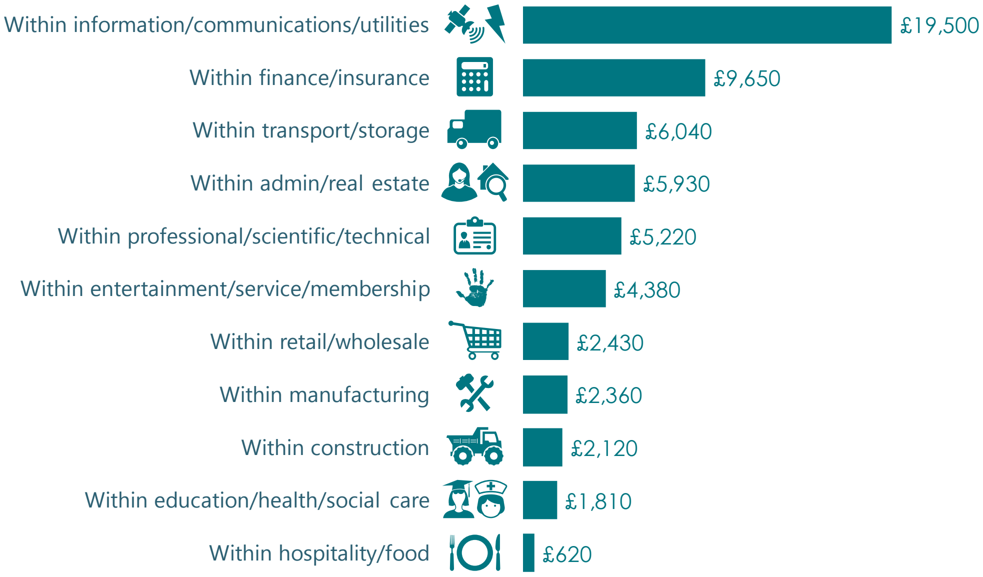
As Figure 4.1 shows, spending again tends to be higher in the sectors that consider cyber security as more of a priority, including the information, communications or utilities sectors and finance or insurance sectors. A notable exception to this, however, is the education, health or social care sectors, where spending tends to be relatively low despite senior managers being more likely than most to see cyber security as a very high priority.

[13] Respondents were asked to include any spending on any activities or projects to prevent or identify cyber security breaches or attacks, including software, hardware, staff salaries, outsourcing and training-related expenses. The figures in Table 4.1 exclude "don't know" and "refused" responses.

[14] Spending figures are presented to 3 significant figures or to the nearest whole number. The differences in mean figures presented here are statistically significant.

[15] Micro and small firms have been merged to make this analysis more statistically robust.

Figure 4.1: Average investment in cyber security in last financial year by sector grouping



Bases: 96 administration or real estate firms; 83 construction firms; 131 education, health or social care firms; 87 entertainment, service or membership organisations firms; 350 finance or insurance firms; 93 food or hospitality firms; 140 information, communications or utility firms; 187 manufacturing firms; 126 professional, scientific or technical firms; 136 retail or wholesale firms; 94 transport or storage firms

Spending is also correlated with turnover, with high-turnover organisations typically spending more as might be expected.

Drivers of investment

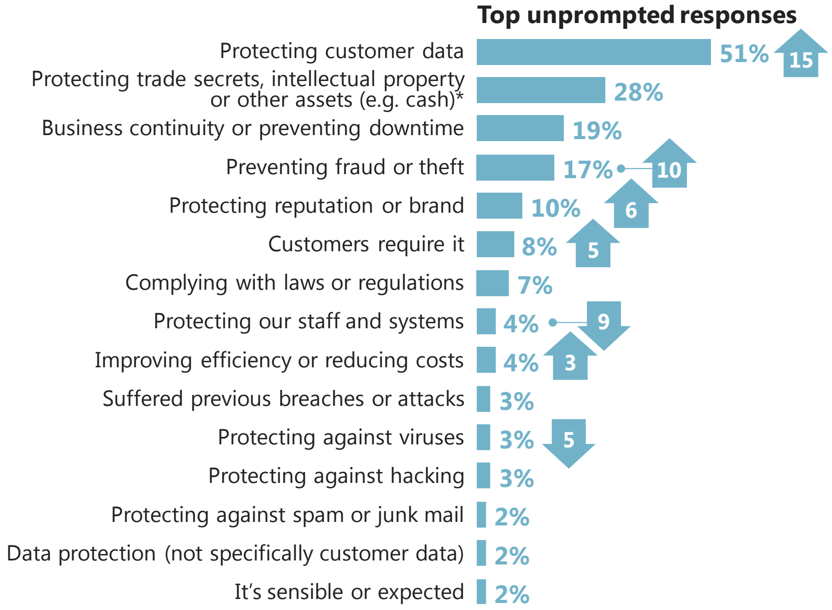
The reasons businesses choose to invest in cyber security have evolved since the 2016 survey, as figure 4.2 indicates. This time, by far the most common main (unprompted) reason for investing is to protect customer data (up 15 percentage points).[16] The increasing importance placed on customer data may be the result of greater pressure from customers themselves in some instances, with the proportion saying their customers demand it having risen (by 5 percentage points) – as aforementioned, this also arose in the qualitative survey as a reason for senior managers to get involved in discussions on cyber security (see section 3.3).

The second most commonly offered reason is around protection of intellectual property, trade secrets or other business assets (28%). In line with last year, fewer businesses see their investment as mainly being about protecting business continuity and preventing downtime (19%), or simply about compliance with laws and regulations (7%). Moreover, more businesses this year seem to be taking a broader view of cyber security – more see their investment as aligned with protecting their reputation (up 6 percentage points) and fewer say a main reason for investing is simply to protect against viruses (down 5 points).

[16] While this question was unprompted, the precoded answer list used by interviewers was amended from the 2016 version. This report only comments on differences where precoded answers are exactly as they were in 2016.

Figure 4.2: Main reasons for investing in cyber security, among businesses who invest

Q. What are the main reasons that your organisation invests in cyber security?



Base: 930 investing in cyber security
*Answer code was "protecting company-owned data/intellectual property" in 2016 so no longer comparable.

There are several subgroup difference in terms of reasons for investing:

- Protecting customer data was a more common main reason among medium firms (62%), as well as the education, health or social care (70%) and finance or insurance (65%) sectors. In the education, health or social care sectors, this reflects the finding from last year's survey that these firms tend to have an especially strong culture of client confidentiality.
- While legal and regulatory compliance is relatively low down the list as a main reason for investing, it is a more frequent reason given among large firms (16%, versus 7% overall) and finance or insurance firms (15%). For the finance or insurance sectors, this may tie in with them expecting to receive cyber security information and guidance from the FCA, as the qualitative survey found.
- Professional, scientific or technical service firms are more likely to say that their customers demand that they invest in cyber security (23%, versus 8% overall). This possibly reflects that many professional services firms such as accountancy firms tend to work for other businesses, rather than for general public consumers.
- Businesses in Scotland are more likely to cite prevention of fraud or theft (28%, versus 17% overall) as one of their main reasons for investing.

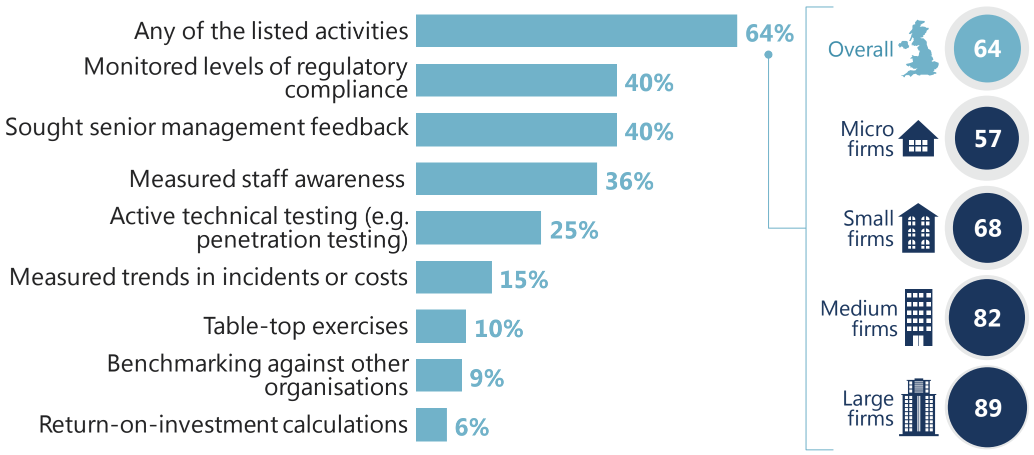
Justifying and evaluating investments

Of those investing, nearly two-thirds (64%) have formally evaluated the effectiveness of their spending on cyber security, in line with last year. The three most common actions around this include monitoring levels of regulatory compliance, seeking senior management feedback, and measuring staff awareness, as seen in Figure 4.3.

All the evaluation methods listed in Figure 4.3 are more common across medium and large organisations – half or more of all medium or large businesses have monitored compliance levels, sought senior management feedback and carried out active technical testing, and almost half (45%) have measured staff awareness in some way.

Figure 4.3: Ways in which businesses have evaluated cyber security spending

Q. In the last 12 months, which of the following things, if any, have you done to formally evaluate the effectiveness of your spending on cyber security?



Bases: 930 investing in cyber security; 286 micro firms; 300 small firms; 238 medium firms; 106 large firms

Businesses in finance or insurance (83%, versus 64% overall) and in the information, communications or utilities sectors (78%) are more likely to have taken any form of evaluative action. Those in the construction sector are among the least likely to have done so (41%).

Mirroring last year's qualitative findings, some businesses interviewed in the latest qualitative phase outlined the importance of showing senior managers the real or physical impact that cyber security breaches could have on the business, in order to justify investment. One IT director at a legal services firm mentioned that they used analogies to help explain the impacts to their board and wider staff.

"If we lost all our email system for a week, or access to our documents for week, what would be the reputational damage from that? I suppose in a traditional insurance sense you'd say, 'if the main road to our building was blocked, what would you do?' What if that's a week?"
Medium business

4.2 Cyber insurance

Uptake of cyber insurance

Almost two-fifths (38%) of firms say they have insurance covering a cyber security breach or attack, which is the same as in 2016. Of these businesses, only two respondents in the survey said they had made a claim on this policy.

Coverage is much more common in the education, health or social care sectors (57%, versus 38% overall), finance or insurance sectors (53%) and administration or real estate businesses (52%). It is also more prevalent among large businesses (48%).

Whereas spending on cyber security is positively correlated with business turnover, there is not such a clear relationship between turnover and cyber insurance. In fact, it is the businesses with mid-level turnover of £2 million to £10 million that are most likely to have insurance (49%), compared to businesses with under £2 million in turnover and those with £10 million or more in turnover (both 36%).

Case study: the length of time taken to make a cyber insurance claim

One micro finance advisory business had a case where one of their client's email accounts was hacked. They (the business) received a fraudulent email from the client's hacked account asking them to change the client's bank details. This later led to money being fraudulently withdrawn in the client's name. The impact was substantive, leading to loss of trust with the client and a new, much stricter authorisation process for making withdrawals, which has affected other clients. The business claimed damages through the cyber security element of their professional indemnity insurance. Making this claim has been longwinded in their view, taking over a year, with a senior director leading on it and using lawyers on both sides. They expect future insurance premiums to be higher, and expect the policy to pay out, but are not sure how much they will get back.

"It's still ongoing and has been going on for over a year … it's quite stressful, and as expected the premiums go up. Whether they pay out the full amount is still undecided."

Impressions of the cyber insurance market

The qualitative survey shows there are very disparate levels of awareness around cyber insurance. Some businesses – typically smaller ones – were simply not aware of the notion at all, while others had looked into it in depth and ruled it out, or were still looking for an appropriate policy.

The larger businesses that had looked into it had mixed impressions about the policies available, and felt that the insurance market still needed to evolve before it became viable for most firms. One investment firm said they had avoided cyber insurance because the impression they had got from various lawyers was that the current crop of available policies failed to cover a range of risks, such as regulator fines or finding alternative office premises. They had also been made aware of other businesses making unsuccessful claims against these policies.

Another legal firm felt that the policies they had seen had set unnecessarily stringent standards for businesses to meet before insuring them, and that these varied considerably across policies, meaning that it was difficult for the business to choose between them. For example, they had seen some policies that required the business to patch every machine on a daily basis, which they felt was not industry best practice and was not physically possible for a medium firm like theirs to fulfil.

These larger businesses also noted that the Government or trade associations might play a role in terms of mandating or lobbying insurers to make cyber insurance policies more consistent. This was both in terms of minimum coverage offered, and also in terms of what the policies demanded from businesses (for example, policies could request compliance with a single recognised standard such as ISO 27001).

One medium solicitor's business noted that some insurance applications had offered a reduced premium if the business was certified with Cyber Essentials or Cyber Essentials Plus. However, in this case, the business said they chose not to do this because they felt the cost of certifying outweighed the potential reduction in premiums.

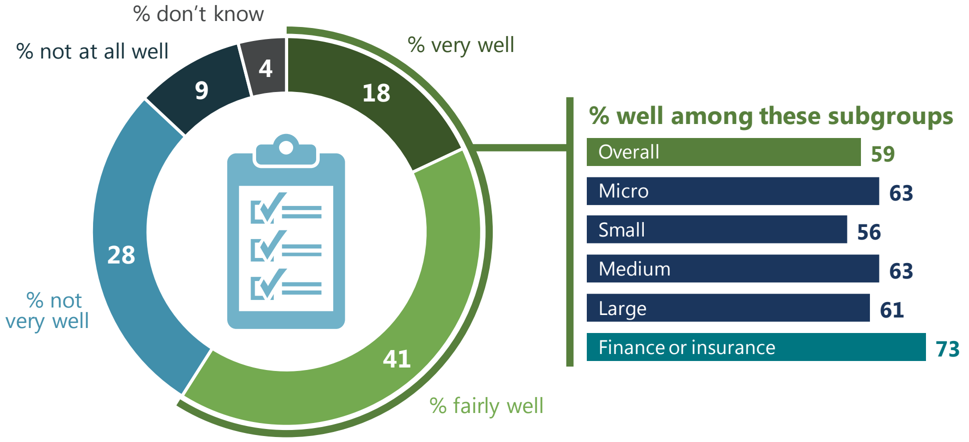
Understanding of coverage

Among those that do have insurance, there is mixed understanding of what this may or may not cover. As Figure 4.4 shows, while most businesses do feel they understand well what their policy covers, just two in ten (18%) feel they understand this very well and almost two-fifths (37%) think they do not understand it well. This is a similar situation across size bands.

Finance or insurance firms tend to be more confident in their understanding than the average business.

Figure 4.4: How well businesses feel they understand their cyber insurance policy

Q. How well, if at all, do you feel you understand what is and isn't covered by this insurance?



Bases: 671 with cyber insurance; 194 micro firms; 222 small firms; 170 medium firms; 85 large firms; 196 finance or insurance firms

Repeating the findings from last year's survey, the qualitative survey in 2017 highlights that businesses may *assume* they are covered for breaches through a more general indemnity insurance policy, which in fact may not cover them. This highlights that the proportion (38%) saying they are insured may in fact be a slight overestimate of those whose policy would specifically cover cyber security breaches.

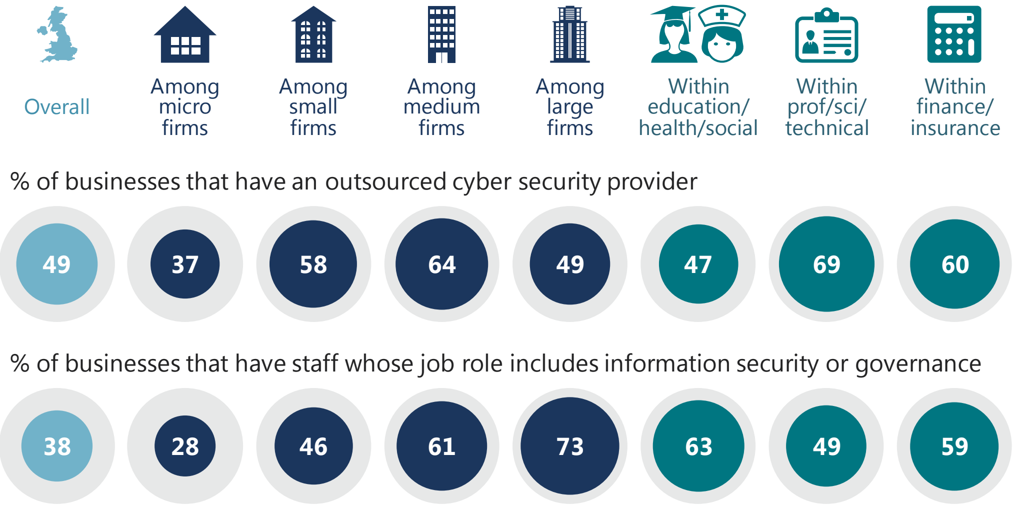
4.3 Management and staff approaches

Who is responsible for cyber security?

Two-fifths (38%) of all firms have specialist information security or governance staff, in line with 2016. This again is much higher among medium and large firms, the majority of which have someone in this role. It is more common in education health or social care (63%), finance or insurance (59%), information, communications or utilities (52%), and entertainment, service or membership organisations (48%).

From Figure 4.5, it can also be seen that, like last year, half of all firms (49%) outsource their cyber security. By sector, outsourcing is more common among finance or insurance (60%,) and professional, scientific or technical service firms (69%). By size, it is more common among small and medium firms. It is therefore the small firms that are most likely to have an outsourced provider and not necessarily to have the internal specialists to manage the relationship with this provider.

Figure 4.5: Whether businesses have specialist staff or outsource cyber security



	Overall	Among micro firms	Among small firms	Among medium firms	Among large firms	Within education/ health/social	Within prof/sci/ technical	Within finance/ insurance
% of businesses that have an outsourced cyber security provider	49	37	58	64	49	47	69	60
% of businesses that have staff whose job role includes information security or governance	38	28	46	61	73	63	49	59

Bases: 1,523 UK businesses; 506 micro firms; 479 small firms; 363 medium firms; 175 large firms; 131 education, health or social care firms; 126 professional, scientific or technical services firms; 350 financial or insurance firms

While high-turnover businesses may have more money to carry out their cyber security functions in-house, the findings actually suggest that high turnover businesses are more likely to outsource cyber security. Seven in ten (69%) of firms with annual sales of £2 million or more have an outsourced provider, versus four in ten (41%) of those with sales of under £2 million.

Working with outsourced providers

The qualitative survey found several reasons behind businesses choosing to outsource cyber security.

- Various businesses noted that they had historically outsourced their IT function, and as cyber security had grown as an issue, it was natural to add this on to the existing IT contract, with a provider that they already trusted.

- One investment business felt they had an outsourced business model, where they wanted to maintain as few core staff as possible, so did not have the budget or office space to carry out cyber security in-house.

- One large legal services business noted that their UK office operated on office hours, but because they had several international clients, they needed 24-hour cyber security. In this context, outsourcing was the solution.

- Some firms carried out as much of their IT function as they could in-house, but still needed to use specialist IT consultants for specific issues. For example, one wholesaler contracted specialists to look specifically at their server security (for instance, to recommend hardware firewalls).

Case study: understanding outsourced provider contracts

The compliance lead at a small investment firm used external IT consultants and lawyers to review contracts with outsourced providers, so they had a clear understanding of the jargon and legalese. However, they would have preferred not to use external consultants for this, partly because it had been challenging to find good IT consultants – they had asked contacts in the compliance sector and looked at the suppliers that the FCA had approved to carry out software audits. They would welcome written guidance to help them review these contracts independently to understand what level of security providers are offering. They also wanted guidance to help them know what questions to ask providers, how the board should assess contracts, and best practice around frequency of communication with providers and frequency of penetration testing. This would save on costs and also give them a better sense of reassurance in their providers.

Staff training

Similar to the 2016 finding, a fifth (20%) of businesses have had staff attend internal or external training on cyber security in the last 12 months, and this was much more common within medium and large firms, shown in Figure 4.6. This breaks down as 13 per cent of all businesses providing training internal to the organisation, six per cent providing external training, and eight per cent where staff attended related seminars or conferences.

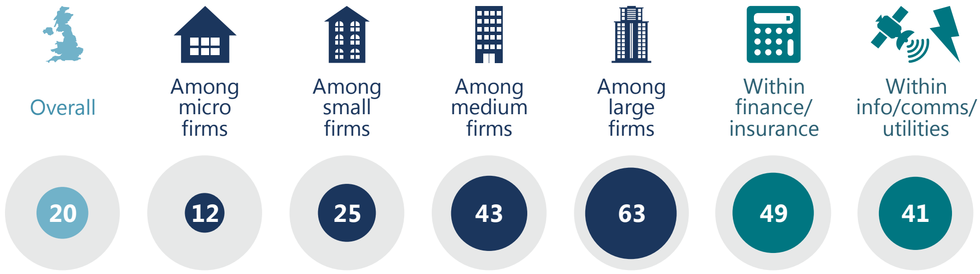
Cyber security training is, as might be expected, more prevalent within the sectors that tend to prioritise cyber security more than others. It is least likely to be seen in the transport or storage (13%), food or hospitality (11%), and construction sectors (10%).

Of all businesses, five per cent (22% among large businesses) include this training as part of an induction process, and 11 per cent (41% among large businesses) offer it as a regular training activity, unchanged from the 2016 results.[17]

[17] While "training" was self-defined by respondents at this question, it is most likely in the wording of the question to be off-the-job training that staff attend away from their day-to-day work.

Figure 4.6: Businesses where staff have had cyber security training in the last 12 months

% of organisations where staff have attended internal or external training, or seminars or conferences on cyber security in the last 12 months

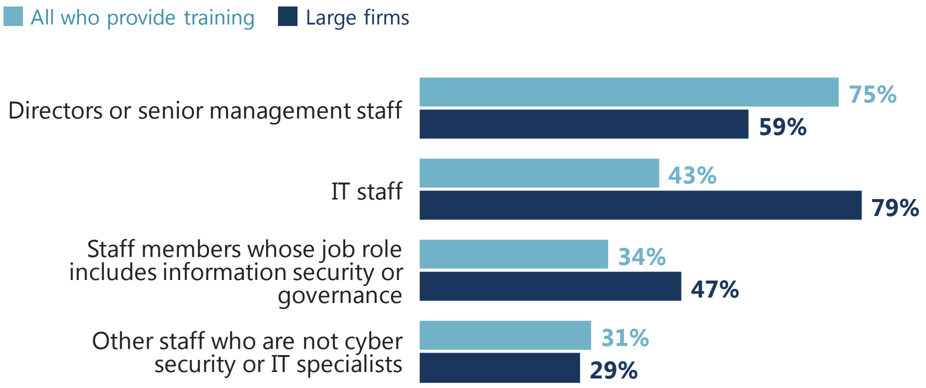


Bases: 1,523 UK businesses; 506 micro firms; 479 small firms; 363 medium firms; 175 large firms; 350 financial or insurance firms; 140 information, communications or utilities firms

Across all size bands, training is less typically offered to non-specialist staff than to specialist staff, as Figure 4.7 indicates. Large businesses are more likely than others to have sent specialists on cyber security training but less likely than others to have trained board members in this way.

Figure 4.7: Which individuals receive training within businesses

Q. Who in your organisation attended any of the training, seminars or conferences over the last 12 months?



Bases: 561 who provide training; 116 large firms

The qualitative survey finds that businesses typically distinguish between training and awareness raising. The businesses interviewed felt that the latter was more important for non-specialist staff, as the main aims were to make them aware of the threat and get them to understand why certain IT restrictions were in place. Businesses also felt that they could not simply block staff altogether from certain actions, as there was a growing expectation across staff to have shareable data and open systems – and therefore there was a need to inform and educate staff.

"The only training staff require is, 'don't open emails when you don't know who the source is, and don't open attachments.' There is training needed, but … the general user needs awareness."
Medium business

This focus on awareness raising above training also reflected the perception that the external training available was often high-end technical training. One small business felt that there was also a lack of mid-level training available. This was training that was not too basic, as their staff were already aware of the issue, but also not aimed at large businesses, involving for example large drills or exercises. They wanted training that would specifically tell their core staff about the latest phishing scams to be aware of.

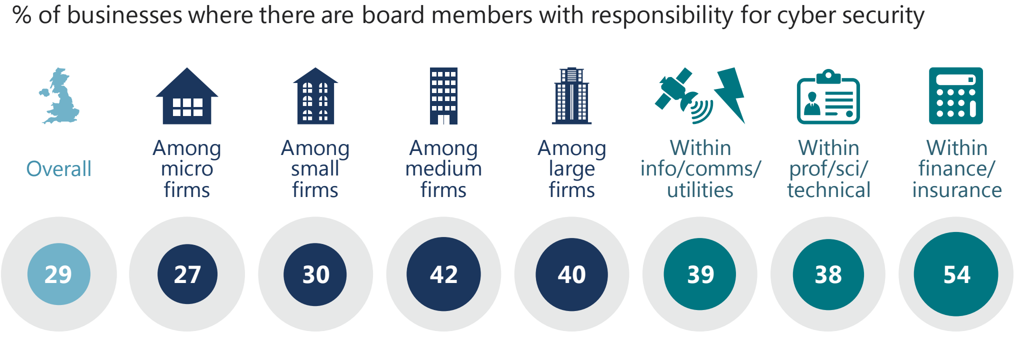
Some businesses felt they carried out awareness raising informally, such as by sharing scam emails that staff came across, and that this was enough to keep staff informed. There was also a sense among some businesses that appropriate responses to cyber threats were all common sense, in terms of not reading unrecognised emails, so staff did not need any formal sessions to cover this. On the flipside, the IT director in one medium law firm had insisted on, and agreed, mandatory "lunch and learn" sessions for all staff to raise awareness of cyber security, on the basis that it would just take a single employee to cause a potentially substantive breach.

4.4 Governance and planning

Board responsibilities

Across all size bands, most firms have not made specific board members responsible for cyber security, as Figure 4.8 shows. This kind of board-level responsibility is more common than average among finance or insurance, information, communications or utilities, and professional, scientific or technical services firms – all sectors where the board tends to treat cyber security as a higher priority than average. It may be that assigning responsibility in this way to board members encourages a stronger senior management focus on cyber security.

Figure 4.8: Whether businesses have board members with responsibility for cyber security

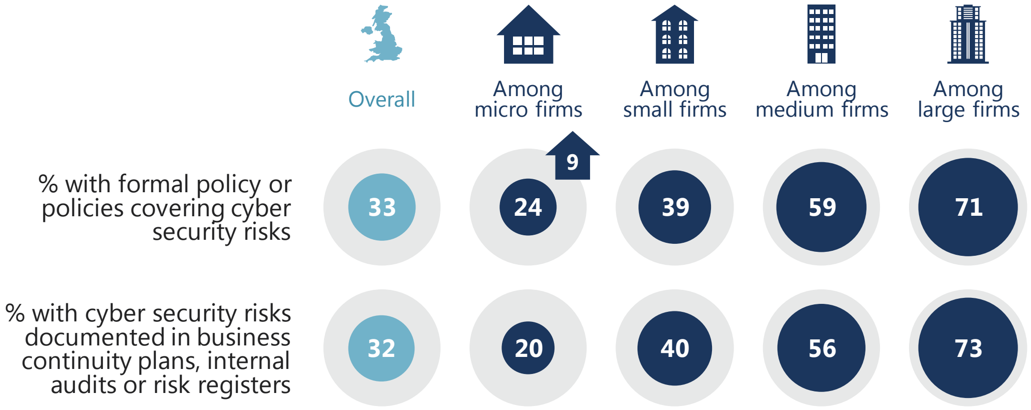


Bases: 1,523 UK businesses; 506 micro firms; 479 small firms; 363 medium firms; 175 large firms; 140 information, communications or utilities firms; 126 professional, scientific or technical services firms; 350 financial or insurance firms

Formal policies and documentation

In line with last year, only around a third of firms have a formal policy on cyber security (33%) or have cyber security risks documented in business continuity plans, internal audits or risk registers (32%) – this is shown in Figure 4.9. Micro businesses are, however, more likely now than in 2016 to have formal cyber security policies in place (up from 15% to 24%) – this aligns with the increasing importance these smaller businesses now attach to cyber security, as evidenced in section 3.3.

Figure 4.9: Whether businesses have formal policies or document cyber security risks



Bases: 1,523 UK businesses; 506 micro firms; 479 small firms; 363 medium firms; 175 large firms

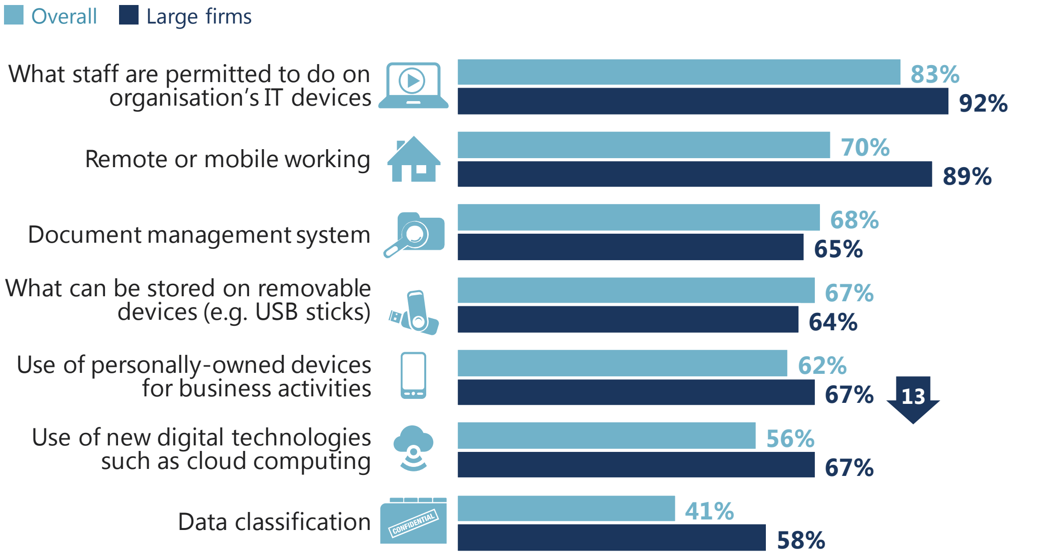
Education, health or social care (62%), finance or insurance (59%), and information, communications or utilities firms (47%) are more likely than average (33%) to have formal policies. Those in the finance or insurance, and education, health or social care sectors are also more likely than average to have documented their risks in internal plans, audits or risks registers (64% and 46% respectively, versus 32% overall), repeating the sector-level differences noted in last year's report.

What is covered in policies?

The main issue covered in cyber security policies (where businesses have these in place) continues to be how staff can use the business's IT devices. As Figure 4.10 identifies, there is typically less coverage of risks potentially occurring outside company-owned devices or environments, for example when it comes to removable devices, personally-owned devices, working from home or cloud computing. Data classification is also something that is more often than not lacking from cyber security policies.

Figure 4.10: Most common features of cyber security policies

Q. Which of the following, if any, are covered within your cyber security-related policies?



Bases: 764 with cyber security policies; 131 large firms

Reasons for not having governance procedures in place

Businesses in the survey that had none of the governance procedures discussed in this section[18] were asked why they did not have these things in place. Those who have no such governance or planning tend to be smaller businesses (65% are micro businesses and 34% are small businesses), so unsurprisingly their main (unprompted) reason across businesses of all sizes is that they perceive themselves to be too small or insignificant to have such things in place (38%). The next most common reasons are that cyber security is not their priority (20%) and that they do not consider themselves to be at risk (18%).

Despite this, it is worth noting that 24 per cent of the smaller businesses lacking any of these governance procedures have had a cyber security breach or attack within the last year. More specifically, 13 per cent have had a breach or attack that had some sort of disruptive outcome on their businesses. This highlights for all micro and small businesses that, in reality, no business is too small or insignificant to be at risk from cyber attacks.

4.5 Risk management

Actions taken to identify risks

Almost three-fifths (57%) of all businesses say they have taken some form of action to identify cyber risks to their organisation. As Figure 4.11 illustrates, this represents an increase in actions taken since 2016 (up from 51%). This improvement is mainly among micro and small organisations (up from 50% to 57% when combined together).

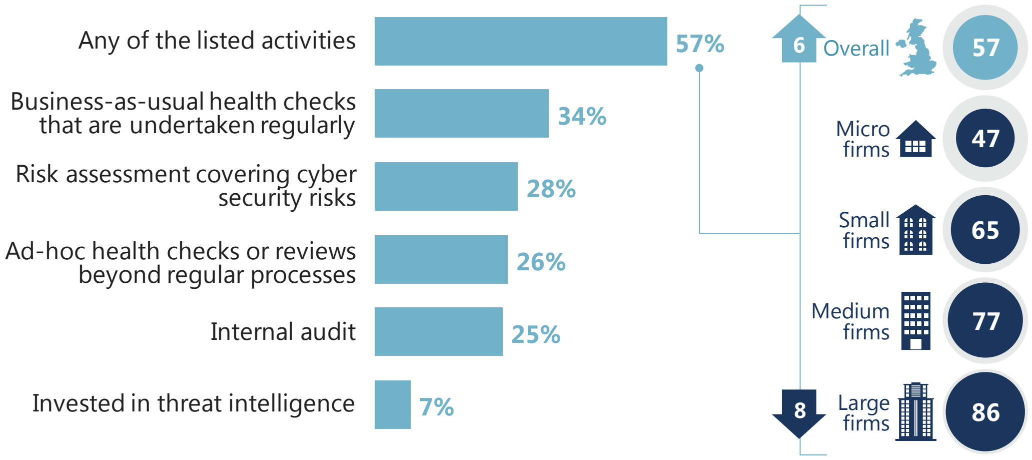
[18] These are businesses that have no board-level cyber security responsibilities, no formal cyber security policies, no business continuity plans, no specialist information security or governance staff, and do not use outsourced cyber security providers.

However, it is worth noting that among large businesses there is in fact less being done to identify risks than last year (down from 94% to 86%). Among medium businesses, fewer are doing business-as-usual health checks than in 2016 (down from 56% to 47%).

Investing in threat intelligence remains especially uncommon. This proportion rises to 19% among medium firms and 29% among large firms (versus 7% overall). Even among very high turnover businesses, the proportion investing in threat intelligence is no different from the average (9% among businesses with annual sales of £10 million and over).

Figure 4.11: Ways in which businesses have identified cyber security risks in the last 12 months

Q. Which of the following, if any, have you done over the last 12 months to identify cyber security risks to your organisation?



Bases: 1,523 UK businesses; 506 micro firms; 479 small firms; 363 medium firms; 175 large firms

Taking any action in this regard tends to be more common among finance or insurance (76%), professional, scientific or technical services (75%), information, communications or utilities (69%) and education, health or social care firms (68%).

Actions taken to prevent or minimise risks

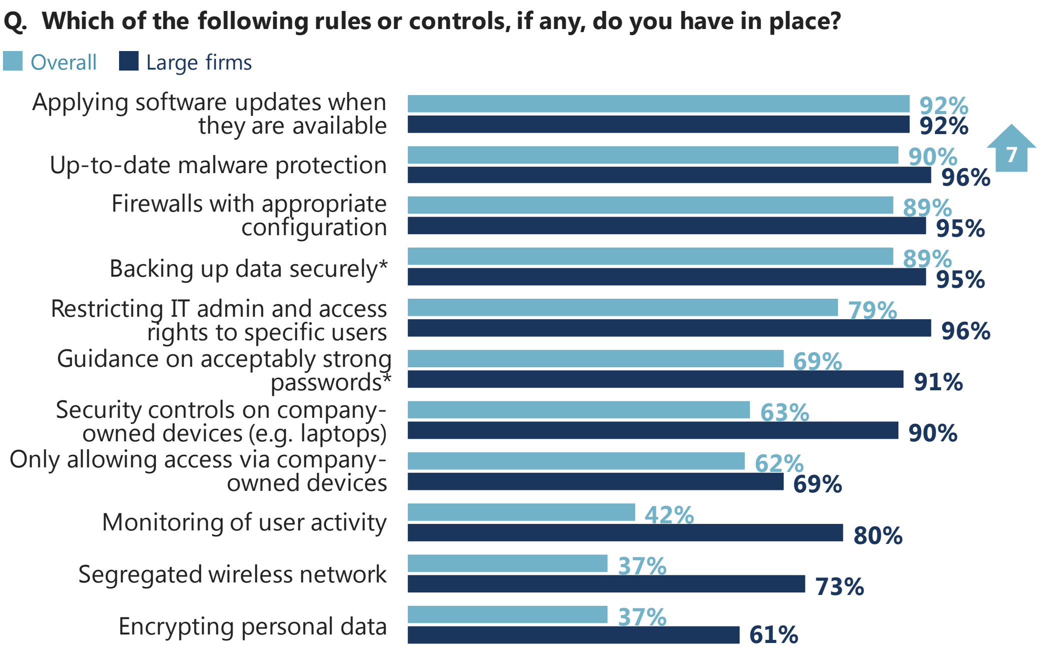
As Figure 4.12 shows, the overwhelming majority of businesses across all size bands continue to have certain cyber security rules or controls in place. Nine in ten regularly update their software and malware protections, have configured firewalls, or securely back up their data. Moreover, more businesses now say they keep their malware protection updated (90%, vs. 83% in 2016) – an improvement largely driven by micro and small firms.

Once again, the majority of organisations also have rules restricting IT access or interactions, restricting access to company-owned devices, and the placing of security controls on devices. Large organisations remain much further ahead in terms of offering guidance on passwords, and implementing controls around wireless networks, user monitoring and personal data encryption.

Rules and controls around encryption continue to be far more atypical across all businesses, including those for whom such rules may be especially important. For example, businesses that hold personal information on customers are more likely than average to have such rules, but over half (55%) do not. Tightening encryption is therefore still a potential area for improvement for many businesses, and firms can consult the Information Commissioner's Office guidance on this topic.[19]

Rules around BYOD still appear challenging for businesses to enforce. While three-fifths (62%) of businesses aim to restrict access to company-owned devices, it is again noteworthy that four in ten (39%) of these businesses still have staff who use personal devices for regular business activities.

Figure 4.12: Rules or controls that businesses have implemented



Bases: 1,523 UK businesses; 175 large firms
*New answer options not present in last year's survey

As per last year, food or hospitality firms tend to lag behind even in terms of the more basic rules and controls. They are again less likely than average to apply software updates when available (79%, versus 92% overall), have updated malware protection (76% versus 90%) or have firewalls with appropriate configurations (81% versus 89%). They are more likely to have segregated wireless networks (49% versus 37%), possibly reflecting the particular prevalence of guest WiFi in restaurants and hotels, and the risks associated with this – although even here, half do not have such controls.

Construction sector firms also fall behind in certain areas, being less likely than average to restrict IT access to certain individuals (64%, versus 79% overall), or monitor user activity (29% versus 42%).

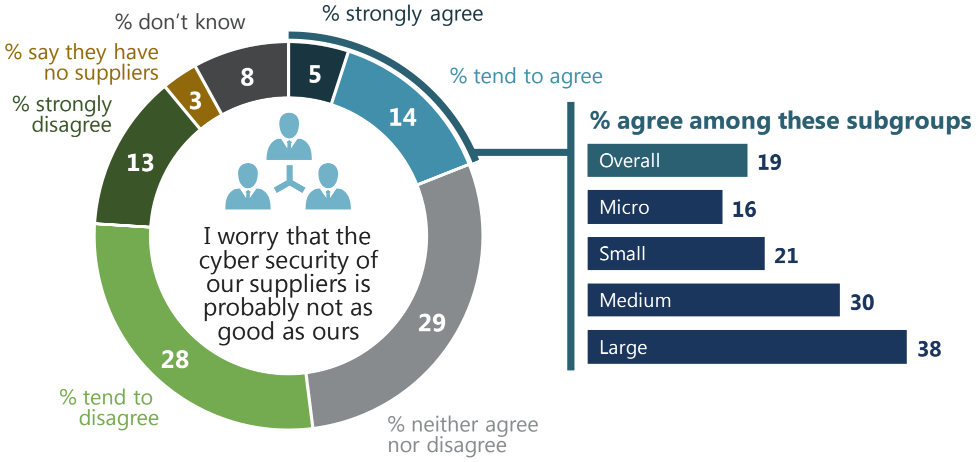
4.6 Dealing with third-party suppliers or contractors

Figure 4.13 shows that a fifth of businesses are worried about the cyber security risk emanating from their suppliers, and that this is even more of a concern among medium and large businesses. Among the latter, more are worried than not worried about this.

[19] See https://ico.org.uk/for-organisations/encryption/.

Figure 4.13: Whether businesses are concerned about suppliers' cyber security

Q. How much do you agree or disagree with the following statement?



Bases: 1,523 UK businesses; 506 micro firms; 479 small firms; 363 medium firms; 175 large firms

At the same time, only 13 per cent of all businesses require their suppliers to adhere to any cyber standards, which is in line with 2016. This is higher in the finance or insurance sectors (30%) and among education, health or social care firms (22%), reflecting that these sectors are also more likely to have documentation to manage their own internal risks.

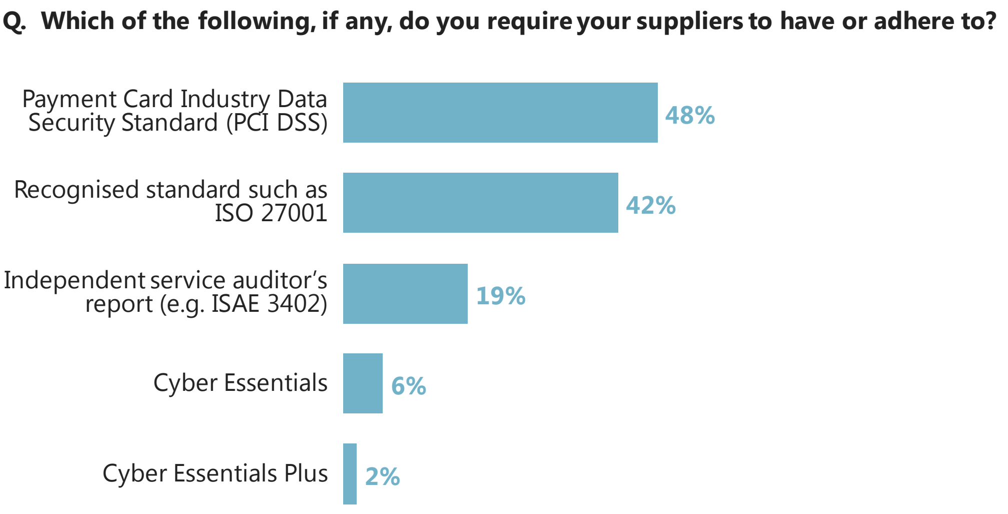
However, even among businesses who are specifically worried about the low standard of suppliers' cyber security, only a fifth (19%) set standards for suppliers to follow. This rises to over a third (36%) among large businesses who are worried about supplier standards, but again far from a majority. This suggests businesses may not recognise the potential they have to set and change supplier behaviour by insisting on certain minimum standards – and this could be an effective way of driving up cyber security across supply chains.

From the supplier point-of-view, cyber security might also be framed as something that can demonstrate their reliability and integrity to their business clients. This came out in the qualitative survey, where one firm of lawyers noted that they wanted to demonstrate to clients that they are a reliable firm and would protect their interests – one aspect of this was complying with customer questionnaires and audits testing their cyber security standards.

"Why wouldn't you do it? Wouldn't you want to show your customers and clients that you're a conscientious firm that is looking out to protect their interests?"
Medium business

Where businesses do set minimum standards, the most common requirements placed on suppliers are to adhere to a recognised international standard, such as the Payment Card Industry Data Security Standard (48%) or ISO 27001 (42%). A small number of businesses are using the Government-endorsed Cyber Essentials scheme with suppliers at present, as shown in Figure 4.14.

Figure 4.14: Most commonly required cyber security standards for suppliers



Base: 313 with supplier standards

4.7 Implementing Government initiatives

Cyber Essentials

The Government-endorsed Cyber Essentials scheme enables businesses to be independently certified for having met a good-practice standard in their cyber security. It requires businesses to enact basic technical controls across five areas: boundary firewalls and internet gateways, secure configurations, user access controls, malware protection, and patch management. The survey findings show that half of all firms (52%), including the vast majority of medium (76%) and large firms (80%), already say they have controls in these areas, unchanged from last year.

As per last year, most – particularly smaller businesses – may not currently realise they can be certified for this.[20] Only three per cent of all businesses *recognise* having implemented the Cyber Essentials standard across their business. The proportions who recognise this have risen since 2016 among medium (up 4% to 9%) and large businesses (up 10% to 19%), although this is still far lower than the proportion of these businesses who would actually meet the standard anyway. Smaller businesses should note the scheme is relevant for businesses of all sizes.

Information, communications or utility firms are also somewhat more likely to recognise having adopted this standard (10%, versus 3% overall), repeating the same sector-level difference from last year.

10 Steps to Cyber Security

The Government's 10 Steps guidance[21] is intended to outline the practical steps that organisations can take to improve their cyber security. These steps have been mapped to specific questions in the survey,

[20] In the survey, the answers taken to indicate these controls are: firewalls with appropriate configuration, security controls on company-owned devices, restricting IT admin and access rights to specific users, up-to-date malware protection, and applying software updates when they are available.

[21] The 10 Steps areas are fully explained on the National Cyber Security Website, at: https://www.ncsc.gov.uk/guidance/10-steps-cyber-security.

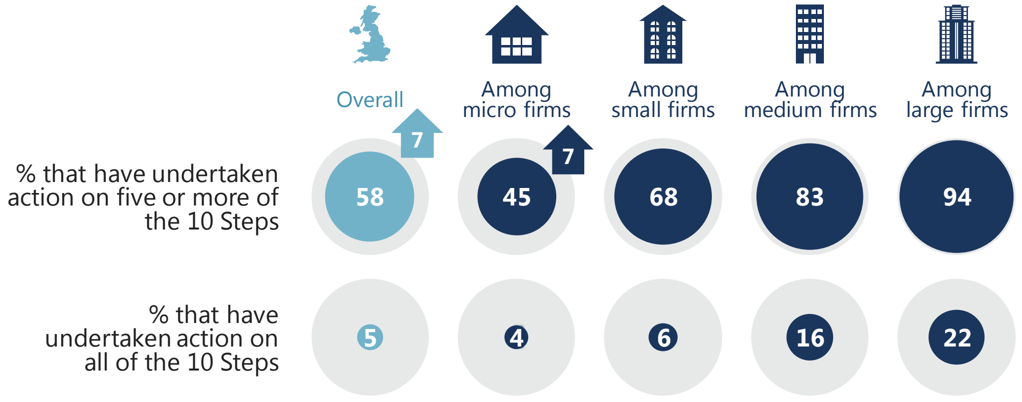
and these are covered individually across this report. Table 4.2 brings them together and again shows a situation very similar to the 2016 findings. While most businesses have certain technical controls, fewer have taken a more sophisticated approach in terms of senior-level risk management, user education and incident management.

Table 4.2: Proportion of businesses undertaking action in each of the 10 Steps areas

	Step description – *and how derived from the survey in italics*	**%**
1	Information risk management regime – *formal cyber security policies or other documentation and the board are kept updated on actions taken*	39%
2	Secure configuration – *organisation applies software updates when they are available*	92%
3	Network security – *firewalls with appropriate configuration*	89%
4	Managing user privileges – *restricting IT admin and access rights to specific users*	79%
5	User education and awareness – *staff training at induction or on a regular basis, or formal policy covers what staff are permitted to do on the organisation's IT devices*	30%
6	Incident management – *formal incident management plan in place*	11%
7	Malware protection – *up-to-date malware protection in place*	90%
8	Monitoring – *monitoring of user activity or regular health checks to identify cyber risks*	56%
9	Removable media controls – *policy covers what can be stored on removable devices*	22%
10	Home and mobile working – *policy covers remote or mobile working*	23%

As Figure 4.15 highlights, three-fifths (58%) of all businesses have undertaken action on five or more of the 10 Steps, which represents an improvement since 2016 (when it was 51%). However, very few have made progress on *all* the steps.

Figure 4.15: Progress in undertaking action on the 10 Steps by size of business



Bases: 1,523 UK businesses; 506 micro firms; 479 small firms; 363 medium firms; 175 large firms

ISO 27001 accreditation

Implementation of the international standard for Information Security Management, ISO 27001, is also relatively uncommon. Among the 21 per cent of firms who are aware of this standard, three in ten (31%) have implemented it and a further fifth (20%) are intending to do so in the future. This is consistent across size bands. Across all businesses (i.e. not just those who are aware of the standard), this equates to seven per cent having implemented ISO 27001 and four per cent intending to do so.

Businesses in the education, health or social care sectors (20%) and the finance or insurance sectors (12%) are more likely than average (7%) to have implemented ISO 27001.

5 Incidence and impact of breaches

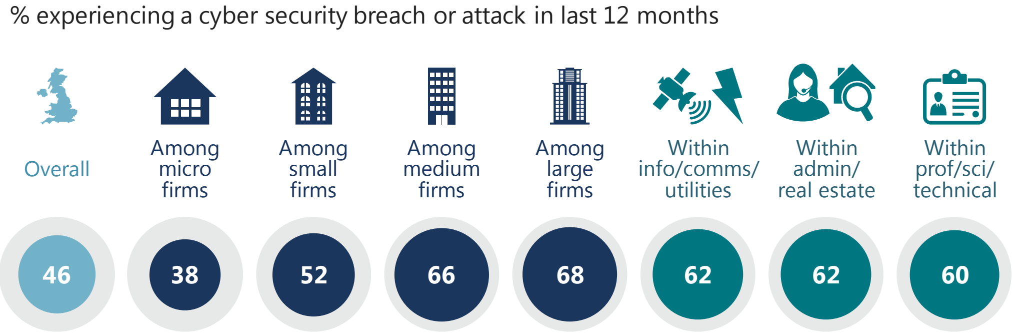
This chapter provides measures of the nature, level, outcomes and impact of breaches incurred by businesses, including estimates of the total economic cost from breaches. The survey aims to account for all types of breaches that a firm might face (although it can only, of course, measure the breaches that have been identified), and also drills down into the most disruptive breaches, and the cost of these.

5.1 Experience of breaches

As can be seen in Figure 5.1 just under half (46%) of all businesses have identified at least one cyber security breach or attack in the last 12 months. While direct comparisons with the 2016 survey cannot be made here[22], the pattern is similar in that as firm size increases, so too does the incidence of breaches. This is the same pattern when looking at turnover as well as number of employees – businesses with a turnover of £2 million or more are more likely than others to identify breaches (65%).

Breaches are also more commonly identified in certain sectors – namely information, communications or utilities (62%), administration or real estate (62%) and professional, scientific or technical services (60%).

Figure 5.1: Proportion of businesses that have identified breaches in the last 12 months



Bases: 1,523 UK businesses; 506 micro firms; 479 small firms; 363 medium firms; 175 large firms; 140 information, communications or utilities firms; 96 administration or real estate firms; 126 professional, scientific or technical service firms

Businesses that hold electronic personal data on their customers are more likely to have had breaches than those that do not (51% compared with 37%).

Nonetheless, breaches are still common even among businesses who do not consider cyber security to be a priority, or who may not think they are exposed to risk. This highlights that there are firms who may mistakenly think that cyber security is not relevant to them, but are also susceptible to breaches.

[22] This latest survey changed the types of breaches asked about in the survey, adding new answer options such as ransomware, and amending previous answer codes to be more specific in some cases. This change means that the results around incidence of breaches, and most of the results covered in this chapter, are no longer directly comparable to the 2016 survey – differences may be due to changes in wording rather than being real changes over time.

- Around a third (35%) of those that say cyber security is a low priority for their senior managers have suffered a breach in the last year. Even when looking at those who say cyber security is a *very* low priority to senior management, two in ten (19%) have identified a breach.

- Among those who say online services are not at all core to their businesses, four in ten (41%) have detected a breach in the last year.

Case study: assuming your industry is immune from cyber attacks

One large materials supplier for the construction industry faced significant and ongoing cyber attacks, despite not having any e-commerce activities. This included over 3,000 phishing emails a month and various ransomware attacks. Despite this, no one in the business had been responsible for cyber security before their Chief Data Officer joined the business three years ago.

Their most disruptive ransomware attack caused their technology team to lose around two weeks of productivity and output. The construction industry as a whole was felt to be behind in terms of cyber security due to most trade and day-to-day business being offline. The ransomware attack opened their eyes to the fact that their business was not immune from cyber attacks. They had since then set up a data security roundtable (involving their major suppliers), started reviewing their cyber security policies and made cyber security one of the top 10 business priorities.

There is also a *higher* incidence of breaches among those taking action to protect themselves. This includes firms that have provided any cyber security training to staff (62% have had breaches, versus 46% overall), firms with any form of governance or risk management arrangements in place (54%), and firms that have invested in cyber security (54%).

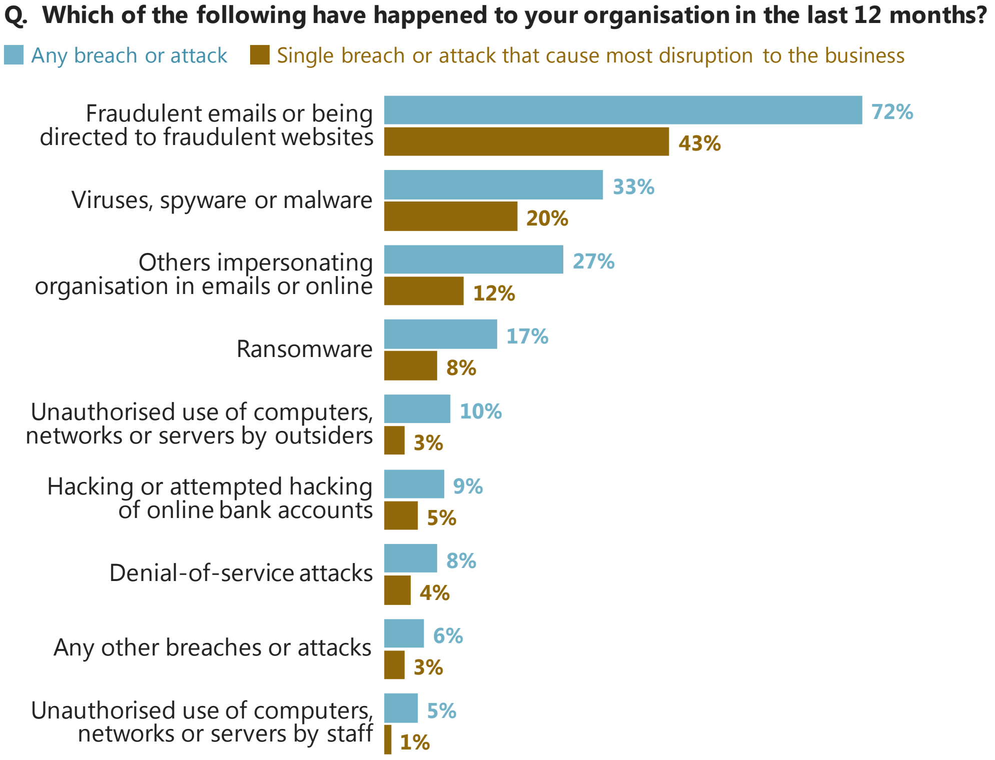
This could of course simply indicate that these firms are better at identifying when they have been breached. It might also suggest firms are putting in place more rules and controls, or spending more in reaction to breaches. Finally, it may be an indicator that the firms who are at most risk of breaches tend to recognise this and take precautions.

Types of breaches experienced

By far the most common type of breach experienced is staff receiving fraudulent emails (72%). This is followed by viruses, spyware and malware (33%), people impersonating the organisation in emails or online (27%) and ransomware (17%). The same pattern emerges when considering the single most disruptive breach, most commonly likely to be phishing emails or websites, as shown in Figure 5.2.

The four most common types of breach can be linked to human factors, such as unwittingly clicking on a malicious link or succumbing to impersonation. This highlights how staff awareness and vigilance are typically important to a business's cyber security, alongside any technical and software protections. Breaches that rely on technical factors beyond the reach of non-specialist staff, such as denial-of-service attacks (attacks that attempt to take down business websites) are relatively less common.

Figure 5.2: Types of breaches suffered among those who have identified breaches



Base: 781 that identified a breach or attack in the last 12 months

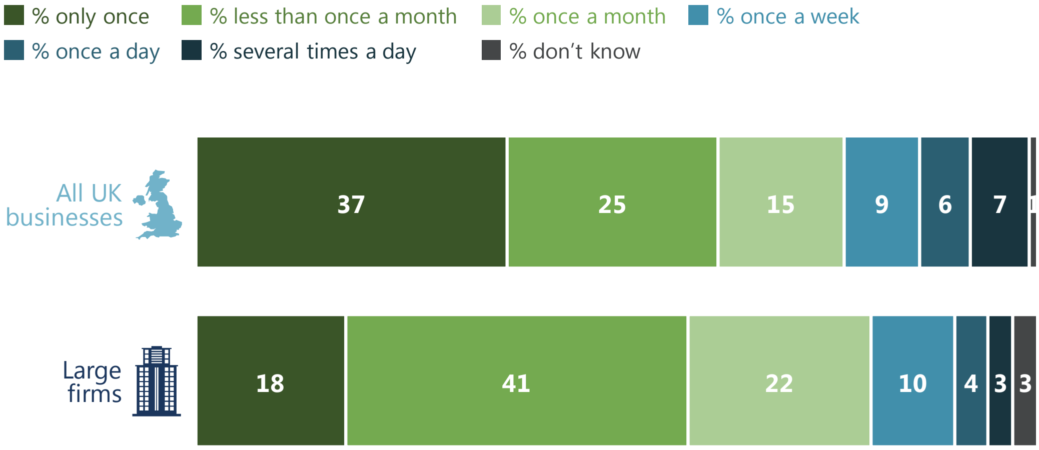
5.2 How are businesses affected?

Frequency and number of breaches

Across all businesses that have experienced breaches or attacks in the last 12 months, for over a third (37%) this was a one-off occurrence. By contrast, a similar proportion experience them regularly (37% at least once a month, including 13% at least once a day). Large businesses are more likely to be struck more often – only two in ten (18%) have had a one-off breach in the last year. However, it is also clear that regular breaches of once a month or more are also experienced by many smaller businesses.

Figure 5.3: Frequency of breaches experienced in the last 12 months

Q. Approximately how often in the last 12 months did you experience cyber security breaches or attacks?



Bases: 781 that identified a breach or attack in the last 12 months; 120 large firms

Table 5.1 shows that the mean number[23] of breaches or attacks is substantially higher than the median number. What this indicates is that the typical business is likely to only experience a handful of breaches in the space of a year, but that a minority experience hundreds of breaches or attacks in this timeframe. Of course, a very small number of businesses are experiencing considerably more, indicating hundreds or even thousands of breaches per week. One large wholesale business, interviewed as part of the qualitative survey, reported receiving approximately 340,000 phishing emails in 2016.

Table 5.1: Average number of breaches among those that identified any breaches in last 12 months

	All businesses	Micro/small[24]	Medium	Large
Mean number	998	891	2,258	7,997
Median number	2	2	4	8
Base	757	414	230	113

Outcomes of breaches

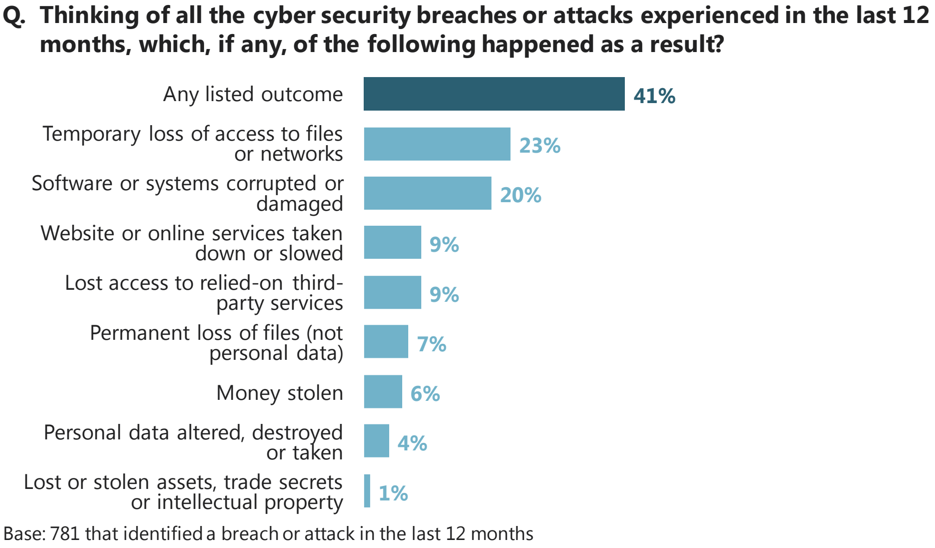
Four in ten businesses (41%) who experienced at least one breach in the last 12 months report an outcome. To put this another way, one in five of *all* UK businesses (19%) say they have experienced a breach resulting in some sort of material loss, as highlighted in Figure 5.4.

The most common outcomes are a temporary loss of access to files or networks (23%), and software or systems becoming corrupt or damaged (20%).

[23] It should be noted that the mean results here are driven up by a very small number of respondents across all size bands reporting an extremely high number of breaches in the past year (in the thousands). The median figures are therefore also shown to give a sense of what the typical business is likely to face.

[24] Data from micro and small firms have been combined to align with the similar analysis on spending data in Chapter 4.

Figure 5.4: Outcome of breaches among those who identified any breaches in the last 12 months



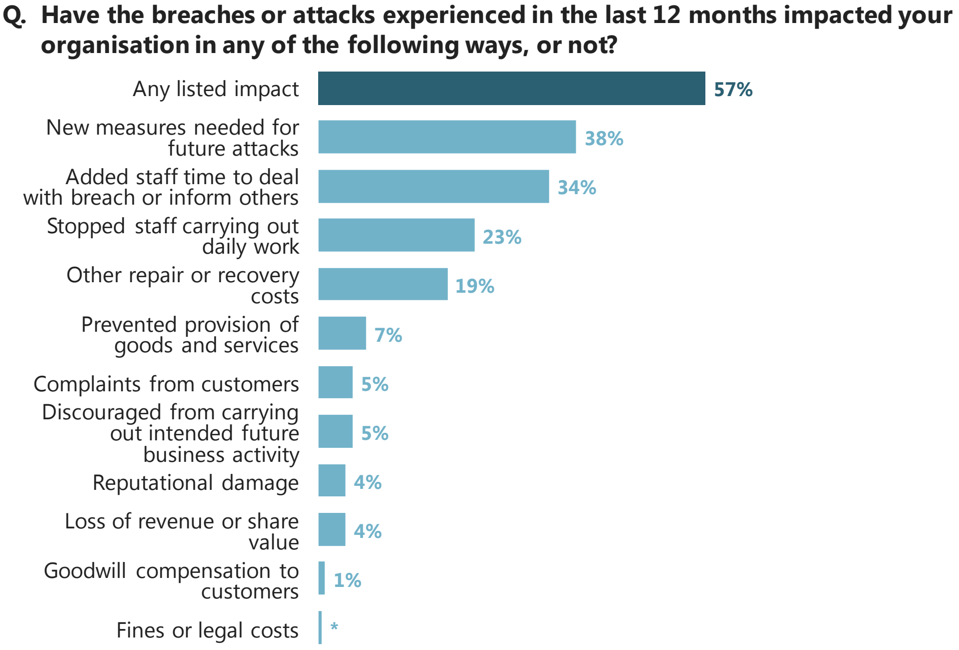
Six in ten (58%) of those identifying a breach report that it resulted in no significant outcome. This high proportion of breaches without any material outcome is likely to be due to the prevalence of two of the most common types. Instances of fraudulent emails and others impersonating the organisation are twice as likely as other types of breach to result in no outcome (66%, versus 33% for other breaches). These breaches are also more likely than others to be identified immediately (69%, compared with 55% overall).

Seven in ten (71%) of the breaches that were identified immediately experienced no outcome, whereas in cases where identification took longer, only a third (34%) experienced no outcome.

Impacts on businesses

Firms who identified a breach were also asked whether there was any impact on their organisation. Six in ten (57%) identify an impact, with the most common being the need to implement new protections against future breaches (38%), staff time taken up dealing with the breach (34%) and through not being able carry out their day-to-day work (23%) and other repair or recovery costs (19%). Other impacts such as reputational damage or a loss of revenue are less commonly identified, as Figure 5.5 suggests.

Figure 5.5: Impacts of breaches among those who identified any breaches in the last 12 months



Base: 781 that identified a breach or attack in the last 12 months
*Denotes a percentage less than one per cent but greater than zero

Among those who say that there was no actual *outcome*, a third (33%) nonetheless report an *impact*. In these cases, the most common impacts are implementing measures against future breaches (20%) and staff time dealing with the breach (17%).

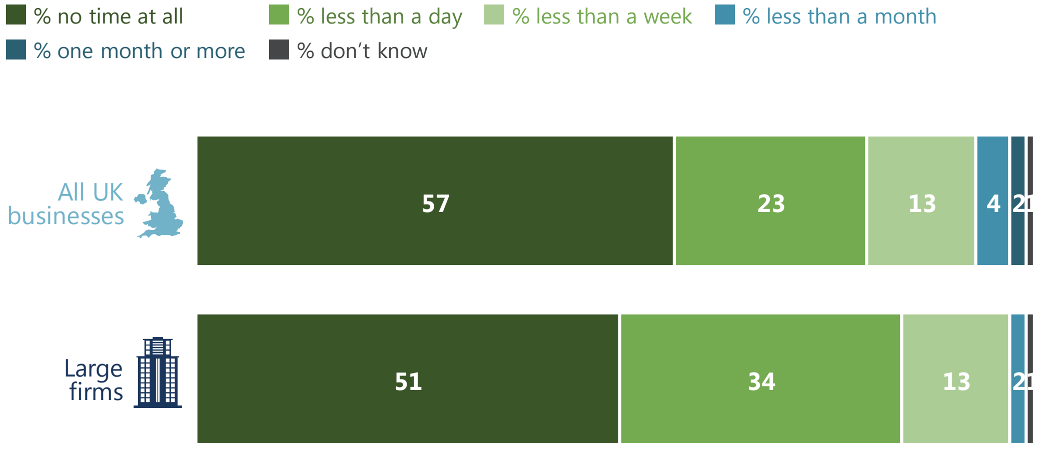
The impacts experienced by a business vary by size. Medium and large firms are more likely to experience any impact (71%, versus 57% overall). Furthermore, large firms specifically are more likely to identify certain types of impacts such as needing to implement preventative measures (58% versus 38%), staff being prevented from carrying out usual work (37% versus 23%) and reputational damage (9% versus 4%).

Time taken to recover from breaches

When asked to consider the single most disruptive breach experienced in the past 12 months, many businesses report that they recover very quickly. Just under six in ten (57%) say that it took no time at all to restore business operations after identifying the breach. For a further quarter (23%), this took less than a day meaning that, overall, eight in ten (81%) have been able to get back to normal in less than a day. This pattern was broadly similar for large firms, as Figure 5.6 shows.

Figure 5.6: Time taken to recover from the most disruptive breach of the last 12 months[25]

Q. How long, if any time at all, did it take to restore business operations back to normal after the (most disruptive) breach or attack was identified?



Bases: 761 that identified a breach or attack in the last 12 months; 112 large firms

In terms of actual manpower, it is medium firms that take the most time on average when dealing with breaches, as shown in Table 5.2. This may be due to facing breaches of a similar frequency and type to large firms, while not having equal resource to deal with them as quickly.

When looking only at those breaches with a material outcome (such as loss of files, money or other assets), the number of days taken is predictably larger. The pattern by firm size again shows that medium firms typically use more manpower to deal with the breach.

Table 5.2: Average time dealing with the most disruptive breach of last 12 months

	All businesses	Micro/small	Medium	Large
	All breaches			
Mean days	1.2	1.2	2.1	1.8
Median days	0.5	0.5	0.5	0.5
Base	750	414	226	110
	Breaches with an outcome			
Mean days	2	1.9	3.8	2.5
Median days	0.8	0.7	1	1.2
Base	336	170	108	58

[25] There were 781 businesses that had at least one breach or attack in the last 12 months. However, only 761 of these were able to say which breach or attack was the most disruptive.

5.3 Financial cost of breaches

Assessing costs

It is very uncommon for businesses to monitor the financial cost of cyber security breaches. In line with last year, only six per cent say that they have anything in place to monitor or estimate how much cyber security breaches or attacks cost their organisation. While this is typically low across firms of all sizes (9% in large firms), regular monitoring is higher in the finance and insurance sectors, although again still unusual (11%).

Firms who have undertaken any cyber security training are also more likely than others to monitor costs (18%, versus 6% overall).

Overall cost of breaches

Table 5.3 shows the costs businesses estimate having incurred from all the cyber security breaches they have experienced in the past 12 months, taking into account all impacts they mentioned resulting from these breaches (see Figure 5.6). Findings are in line with the 2016 survey, with the differences not being statistically significant.[26]

As Table 5.3 shows, larger firms tend to incur much more substantial costs from all the cyber security breaches that they experience, possibly reflecting that they may be incurring more complex or challenging breaches, or have more sophisticated systems that are harder to repair.

The median cost of all breaches is zero, reflecting the fact that the majority of breaches have no actual outcome. As aforementioned in this report, a single type of breach – staff receiving fraudulent emails – makes up 43 per cent of the most disruptive breaches, and this type is more likely than others to have no actual outcome. Considering only breaches with an outcome, again it can be seen that larger firms incur more substantial costs.

Once again, the mean cost of breaches is substantially higher than the median cost. This highlights that the majority of businesses do not experience breaches with significant financial consequences, but for the minority of firms that do experience these serious breaches, the costs can be extremely high.

It is worth noting that the lack of certainty around the likely cost of any breach can make it difficult for businesses to fully understand the return on their investment in cyber security.

[26] While the absolute differences in the results between 2016 and 2017 are large, these were found to be not statistically significant at the 0.05 level (p=0.14), based on a t-test on the financial values (log transformed) by survey year. The 2016 estimates were adjusted by a factor of 1.017 to account for inflation between 2016 and 2017.

Table 5.3: Average cost of all breaches identified in the last 12 months

	All businesses	Micro/small	Medium	Large
	All breaches			
Mean cost	£1,570	£1,380	£3,070	£19,600
Median cost	£0	£0	£0	£1,470
Base	737	413	218	106
	Breaches with an outcome			
Mean cost	£2,330	£2,070	£5,950	£13,200
Median cost	£300	£300	£1,000	£8,230
Base	321	167	102	52

Costs associated with the most disruptive breaches

Tables 5.4 to 5.7 show cost estimates for the single most disruptive breach in the last 12 months. Again, these are presented for all breaches, as well as those with an actual outcome. In this year's survey businesses were asked to consider separately the direct cost, the cost of recovery and the long-term cost.

Direct costs include: costs from staff being prevented from carrying out their work; lost, damaged or stolen outputs, data, or assets; and lost revenue if customers could not access online services. For smaller and medium businesses, direct costs make up the greater part of the total cost of their most disruptive breach, as the following tables show.

Table 5.4: Average direct cost of the most disruptive breach from the last 12 months

	All businesses	Micro/small	Medium	Large
	All breaches			
Mean cost	£780	£740	£1,400	£2,600
Median cost	£0	£0	£0	£0
Base	722	405	216	101
	Breaches with an outcome			
Mean cost	£1,320	£1,220	£2,880	£4,270
Median cost	£150	£150	£160	£870
Base	318	166	100	52

Recovery costs include: additional staff time needed to deal with the breach or to inform customers or stakeholders; costs to repair equipment or infrastructure; and any other associated repair costs. For large businesses, recovery costs are the most substantive costs they face from their most disruptive breaches.

Table 5.5: Average recovery cost of the most disruptive breach from the last 12 months

	All businesses	Micro/small	Medium	Large
	All breaches			
Mean cost	£390	£330	£690	£8,020
Median cost	£0	£0	£0	£0
Base	724	405	219	100
	Breaches with an outcome			
Mean cost	£780	£650	£1,420	£12,200
Median cost	£0	£0	£170	£930
Base	318	165	102	51

The long-term cost of breaches includes: the loss of share value; loss of investors or funding; long-term loss of customers; costs from handling customer complaints; and any compensation, fines or legal costs. It is worth noting that this set of costs is likely to be more difficult for firms to estimate, meaning these figures are likely to have higher margins of error. Nonetheless, it is evident that most firms tend to expect no long-term costs from breaches, whereas a minority again expect substantive costs.

Table 5.6: Average estimated long-term cost of the most disruptive breach from the last 12 months

	All businesses	Micro/small	Medium	Large
	All breaches			
Mean cost	£560	£560	£650	£840
Median cost	£0	£0	£0	£0
Base	712	401	209	102
	Breaches with an outcome			
Mean cost	£760	£730	£1,190	£1,550
Median cost	£0	£0	£0	£0
Base	308	161	94	53

6 Dealing with breaches

This chapter explores how well firms deal with breaches, including identification, response, reporting and adaptation to prevent future breaches.

In the survey, questions on this topic were generally framed in terms of the most disruptive breach a firm had faced in the last 12 months. Sector and regional subgroup analysis has not been undertaken on these questions due to small sample sizes within businesses that have experienced breaches.

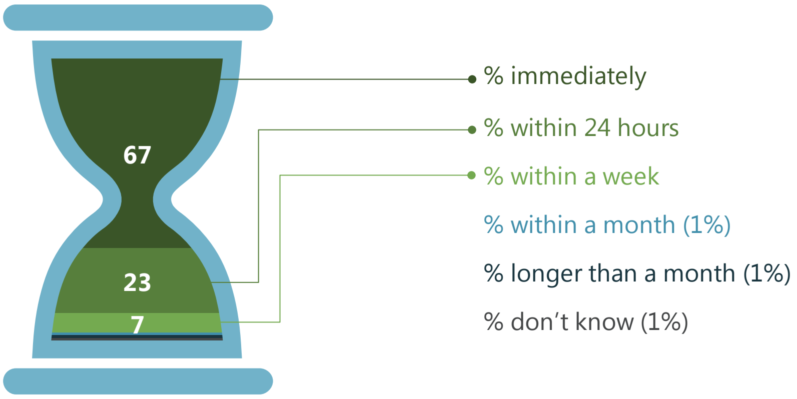
6.1 Identifying and understanding breaches

How and when were breaches identified?

By and large, businesses report that even their most disruptive breaches were very quickly identified. Two-thirds of businesses (67%) identified the breach immediately, and a further quarter (23%) did so within 24 hours, meaning that overall nine in ten (90%) were identified within 24 hours.[27]

Figure 6.1: Time taken to identify the most disruptive breach of the last 12 months

Q. How long was it, if any time at all, between this breach or attack occurring and it being identified as a breach?



Base: 761 that identified a breach or attack in the last 12 months

When asked (unprompted) how their most disruptive breach was identified, the top response from businesses is that it was found by staff or contractors working at their organisation (57%). The next most common response, mentioned by far fewer businesses, is that the breach was identified by antivirus or anti-malware software (13%).

The fact that staff are most likely to identify breaches is again driven by the type of breaches most businesses experience (i.e. staff receiving fraudulent emails or being directed to fraudulent websites). In

[27] As in chapter 5, changes made to the question asking what breaches businesses had experienced in the 2017 survey mean that direct comparisons between 2016 and 2017 at subsequent questions (all the questions featured across this chapter) are not possible.

cases where this was the most disruptive breach, it was more likely to be identified immediately (82%, versus 67% overall).

It is by contrast rare for breaches to be identified by anyone outside the company. The most common form of external identification is customers reporting the breach or making a complaint, mentioned by just six per cent.

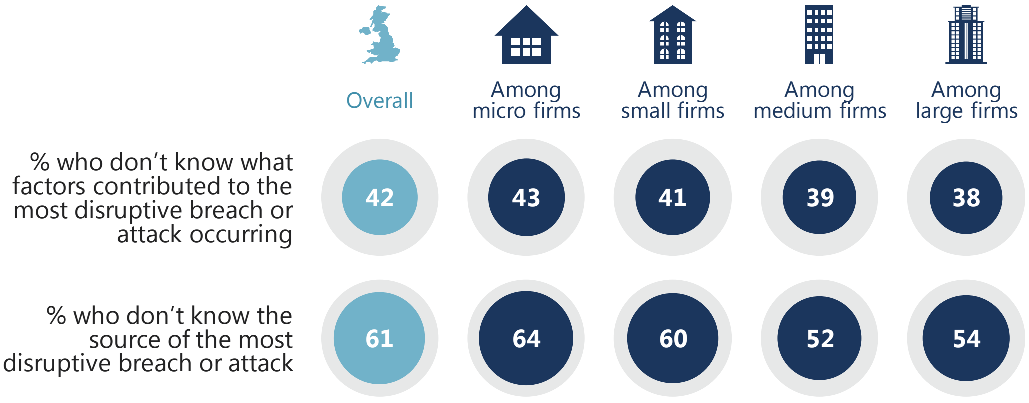
It might be expected that businesses whose core (non-specialist) staff have attended cyber security training would be quicker to identify breaches, but there is no significant difference in this regard. However, there is a difference in businesses where someone has specifically attended a seminar or conference on cyber security – these firms are more likely than others to identify breaches immediately (81%, compared with 67% overall). The qualitative survey suggests that after attending seminars or conferences, this can prompt follow-up action to raise awareness among other staff.

How well do businesses understand their breaches?

Businesses are often unsure of the factors contributing to the breaches they face. When asked (again unprompted) to name the factors, around four in ten (42%) are not able to do so – this is even the case among large firms that tend to have more sophisticated approaches to cyber security. Beyond this, the most common responses are that it was an external attack not specifically targeted at their organisation (13%), human error (11%), due to out-of-date or unreliable antivirus or other software (8%), or staff lacking awareness or knowledge (7%).

Businesses are less sure still about the source of the breaches, with six in ten (61%) saying that they do not know, as Figure 6.2 indicates. The next most common (again unprompted) response, given by one-fifth (22%), is that emails, attachments or websites were the source of the breach. No other response is particularly prevalent, with organised crime, mentioned by seven per cent, being the next most common.

Figure 6.2: Businesses' understanding of the factors and sources behind their most disruptive breaches of the last 12 months



	Overall	Among micro firms	Among small firms	Among medium firms	Among large firms
% who don't know what factors contributed to the most disruptive breach or attack occurring	42	43	41	39	38
% who don't know the source of the most disruptive breach or attack	61	64	60	52	54

Bases: 761 that identified a breach or attack in the last 12 months; 179 micro firms; 241 small firms; 229 medium firms; 112 large firms

While many businesses are unsure about the contributing factors and sources for their most disruptive breaches, the role played by staff should again be noted. Among those businesses who are able to give an answer, two-fifths (43%) identify contributing factors relating to a lack of care or awareness, such as human error, staff not adhering to policies or processes, staff lacking awareness or knowledge, staff visiting untrusted or unsafe websites, or interacting with unusual or spam emails.

Along similar lines, 56% of those who can give an answer mention emails, attachments or websites as the source of the breach. This highlights the importance of staff awareness and understanding around cyber security, as well as having appropriate technical and software protections in place.

Accidental versus intentional breaches

Two-thirds of businesses (66%) consider their most disruptive breach to have been intentional, whereas one-fifth (19%) consider it to have been accidental. The survey finds that micro and small businesses are just as likely as larger businesses to be subject to an intentional breach or attack.

While there are no significant differences by size, those who say that online services are to a large extent core to their business are more likely than others to consider the breach to have been intentional (83%, compared with 66% overall).

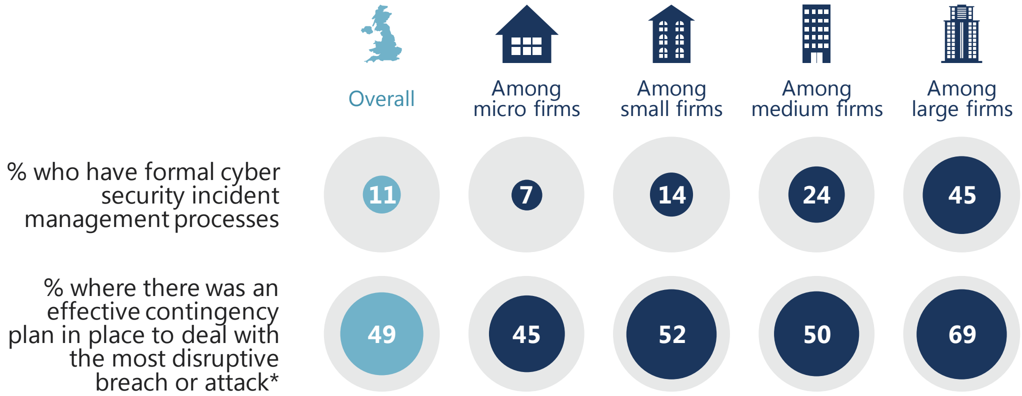
6.2 Responding to breaches

The likelihood of having formal incident management processes or contingency plans in place varies by size of business, as can be seen in Figure 6.3. These findings are in line with those from 2016.

Overall, only 11 per cent of firms have incident management processes in place. However, this rises to a quarter (24%) of medium firms and over two-fifths (45%) of large firms. Large firms are also more likely than average to say they had effective contingency plans in place for their most disruptive breach (69%, versus 49% overall). This is in line with the findings across chapter 4, indicating that larger firms tend to have all-round better documentation when it comes to cyber security.

Virtually all businesses (98%) who have a contingency plan in place for breaches say that the plan was effective for dealing with their most disruptive breach.

Figure 6.3: Whether businesses have incident management processes and contingency plans



	Overall	Among micro firms	Among small firms	Among medium firms	Among large firms
% who have formal cyber security incident management processes	11	7	14	24	45
% where there was an effective contingency plan in place to deal with the most disruptive breach or attack*	49	45	52	50	69

Bases: 1,523 UK businesses (*761 that identified a breach or attack in the last 12 months); 506 micro firms (*179); 479 small firms (*241); 363 medium firms (*229); 175 large firms (*112)

The presence of a formal incident management process tends to be higher among finance or insurance firms (28%, versus 11% overall), education, health or social care firms (21%) and information, communication or utilities firms (19%).

As may be expected, firms who consider cyber security to be a very high priority are also more likely to have had an effective contingency plan in place (55%, versus 49% overall).

6.3 Reporting breaches

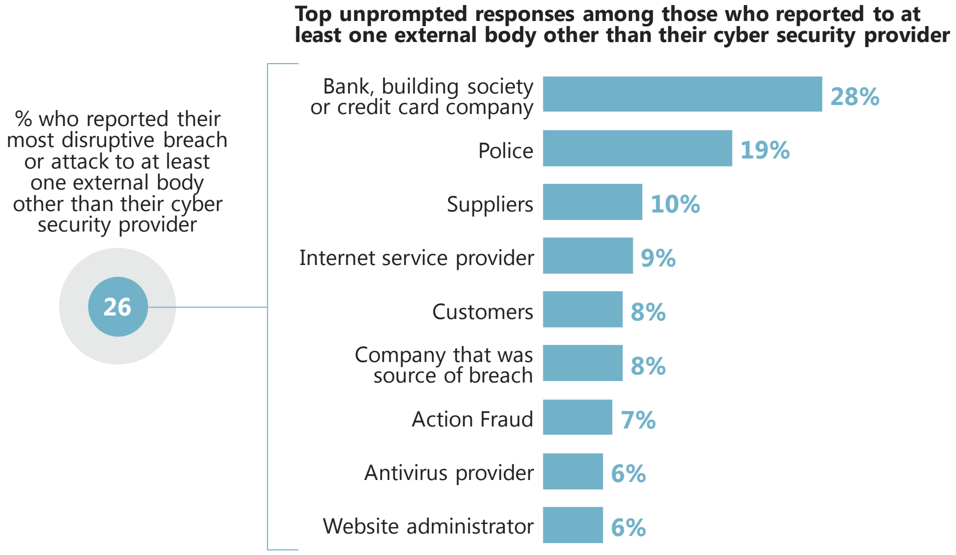
The overwhelming majority (92%) of businesses that had breaches made their organisation's directors or senior management aware of their most disruptive breach.

However, *external* reporting of breaches is very limited. Just over four in ten (43%) reported their most disruptive breach outside their organisation, and most commonly this was reported only to an outsourced cyber security provider (where the reporting might be to enable them to make repairs).

A quarter (26%) of the most disruptive breaches were externally reported to anybody outside of an outsourced cyber security provider. The most common places to report the breach were to a bank, building society or credit card company (mentioned, unprompted, by 28%), followed by the police (19%). This is shown in Figure 6.4.

Figure 6.4: Reporting of the most disruptive breach of the last 12 months, excluding those who reported only to their outsourced cyber security provider

Q. Who was this (most disruptive) breach or attack reported to?



Bases: 761 that identified a breach or attack in the last 12 months; 192 that reported the breach, excluding those who reported only to their outsourced cyber security provider

Beyond the police, there is little reporting of breaches to public sector agencies. Action Fraud is the most common (accounting for 7%), with other public sector agencies mentioned in a handful of cases such as the Centre for the Protection of National Infrastructure (CPNI), the Cyber Security Information Sharing Partnership (CISP), and Cifas (the UK fraud prevention service). While not directly comparable, these findings are very similar to those from the 2016 survey.

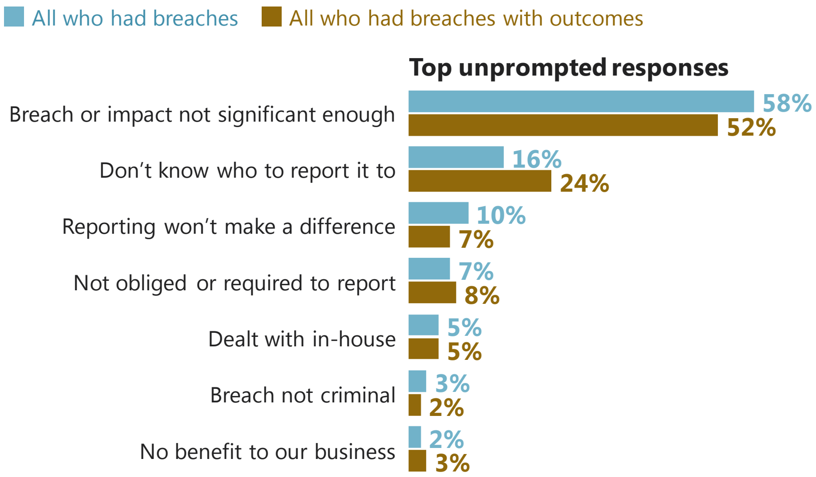
No significant differences are seen in reporting behaviours by size of business.

Reasons for not reporting breaches externally

The relatively sporadic mentions of public or policing bodies could reflect the fact that businesses may not see their breach as criminal. Among those who did not report their breaches, six in ten firms (58%) say this is because they did not consider the breach or its impact to be significant enough, as illustrated in Figure 6.5. Even in cases where breaches have had a material outcome for the business in question, such as loss of files, money or assets (see section 5.2), half (52%) of those who did not report say this is because the breach was not serious enough.

Figure 6.5: Most common reasons for not reporting the most disruptive breach of the last 12 months

Q. What were the reasons for not reporting this breach or attack?



Bases: 432 that identified a breach or attack in the last 12 months and did not report it externally;
166 that identified a breach or attack with an outcome in the last 12 months and did not report it externally

Figure 6.5 also suggests that businesses need to be given more guidance on where and why to report breaches before this reporting will take place. One of the most common reasons for not reporting a breach is not knowing who to report it to, mentioned by 16% per cent. One in ten businesses (10%) believe that reporting a breach would not make a difference. In the qualitative interviews, one business suggested that reporting would help to improve national cyber security, and that this message could nudge more businesses to report breaches.

Case study: reporting a breach and receiving feedback

A medium-sized software vending firm had occasionally received emails from people impersonating staff within their business. On a few occasions they had taken the time to report these to the National Cyber Crime Unit (NCCU) within the National Crime Agency. They found it to be a fairly easy but not an entirely quick process to fill in the relevant forms, which were available online. Upon submission the forms were acknowledged, but they felt they may have benefitted from receiving further information and guidance as part of a follow-up, to give them a clearer incentive to report any future incidents.

"Ideally the NCCU would provide more information on the threat and how we should be dealing with it. Also, they could say more about how they were using the information to deal with it at a national level. This would make the process seem more worthwhile. They probably found it useful but you're never quite sure how useful it is, and whether it's worth doing in the future."

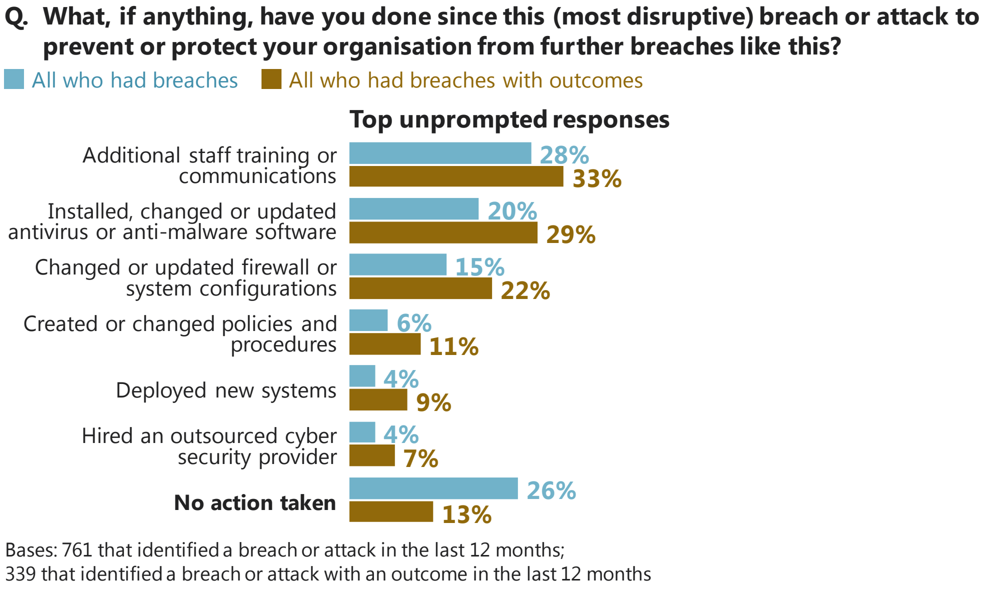
Preventing future breaches

The most common action taken after a breach is to raise staff awareness via training or communications (28%). This once again suggests that staff are seen as being both the first line of defence, and a potentially weak link when it comes to cyber security breaches.

As seen in Figure 6.6, other common actions are to install or update antivirus or anti-malware software (20%), or review firewall and system configurations (15%). Relatively few (6%) have created or updated their policies or procedures in response to their most disruptive breach, while a quarter (26%) have taken no action at all.

As may be expected, the picture changes slightly when looking only at organisations whose most disruptive breach resulted in a material outcome (e.g. the loss of files, money or other assets). The most common responses remain the same, but each is more likely, and just over one in ten (13%) of these businesses report taking no action.

Figure 6.6: Most common actions following the most disruptive breach of the last 12 months



Efforts to mitigate against future breaches vary by size of business. Large firms are more likely to respond with training or communications (45%, compared with 28% overall) and are also twice as likely to create or update policies or procedures (13% versus 6%).

Micro firms may need additional support or guidance in responding to breaches, as they are more likely than others to have taken no action at all (37%, versus 26% overall).

Case study: responding to breaches with staff training

A small finance business experienced a ransomware attack that came via an email, and affected a number of different drives. They had contingency plans that proved effective, but they lost staff time as it took three days to restore their files. This was very worrying for them and the absence of any specialist IT staff on site meant that they lacked confidence in this area. As a result, they have since provided cyber security training to their staff. They have talked to them about how ransomware is delivered and what it looks like.

7 Conclusions

The Cyber Security Breaches Survey series shows that cyber security is an issue that affects UK businesses of all sizes and sectors. The 2017 survey shows that the number of businesses with an online presence is growing, as too is the number storing data on the cloud. Alongside this, there is an increasing prioritisation of cyber security, and more businesses have attempted to identify the risks they face.

Nearly half of all UK businesses have identified a breach or attack in the last 12 months. While breaches do not always result in a material outcome, such as loss of data or network access, in cases where this does happen, it has a significant impact on the organisation. The survey finds that these organisations can also face considerable financial costs from breaches, not just in terms of the direct results of the breach and recovery or repair costs, but also in terms of the long-term damage to the business's reputation, among customers or investors.

The findings suggest that the prevalence of ransomware in particular has heightened awareness and made cyber security a more urgent issue for a wider range of businesses. The qualitative survey in particular highlights how businesses in sectors that may not expect to be targeted are falling victim to costly ransomware attacks. Such attacks also highlight the inherent value of the data that businesses hold, beyond personal or financial data – with attacks on any kind of data potentially stopping businesses from carrying out day-to-day work and putting relationships with customers at risk.

The 2017 survey shows some of the major challenges that businesses, and the Government in its effort to work alongside them, face in further improving their cyber security defences:

- Businesses are likely to find the information and guidance provided by the Government useful, but relatively few have sought out this information. Currently, many businesses rely on their outsourced providers for advice and guidance, but there is often a lack of trust around advice from private sources. The Government's recently-launched National Cyber Security Centre is intended to make Government guidance easier to find and understand.

- Similarly, while most businesses have at least some basic technical controls, such as firewalls, patched software and anti-malware programmes, few are aware they can be certified for having the full range of controls in the Government-endorsed Cyber Essentials scheme.

- External reporting of breaches remains uncommon. Both the survey and the qualitative interviews suggest businesses do not always see the benefits of reporting and are unsure who to report to. Many also think that only breaches they consider to be substantive need reporting.

- The prevalence of cyber security training and of cyber insurance has not changed since 2016, and the 2017 qualitative findings show the structural challenges that businesses face when exploring both training and insurance. In the qualitative survey, businesses felt they would benefit from being signposted to training materials or providers. In cases where a non-specialist in the business was responsible for cyber security, they specifically requested further guidance and training on how to negotiate and manage contracts with external IT consultants or cyber security providers. In terms of insurance, the survey indicates that some businesses want to see more specific coverage and more consistency in the insurance policies on the market before they consider investing in insurance.

The findings also highlight certain key audiences for businesses of all sizes and sectors to focus their efforts on, including the wider workforce, senior managers and suppliers:

- In addition to having good technical controls and governance measures in place, awareness raising and education across all staff – not just specialist IT staff – is important in helping businesses to avoid the most common breaches. Currently, cyber security training is uncommon, and when it does take place it is more likely to be offered to IT staff than to the wider workforce. Despite this, the main types of breaches that organisations face tend to be phishing, viruses and ransomware attacks – attacks that can exploit human error, as well as technical flaws in cyber security.

- Raising the profile of cyber security among senior managers is equally important. The qualitative survey shows that while senior managers are in charge of decision-making, they may not fully understand the consequences of cyber security breaches. Only a third of businesses have board members with responsibility for cyber security, and the qualitative survey also highlights the value of directors being educated on the issue, and sharing good practice across the various businesses they are involved with.

- The qualitative survey shows that businesses need to consider cyber security risks outside of their own controlled environments, for example the risks posed by their own customers or suppliers being breached. A fifth of businesses noted concerns about their suppliers' cyber security in 2017, yet fewer than this require suppliers to adhere to specific cyber security standards or codes of good practice, suggesting not all businesses are attempting to contain this risk.

Guide to statistical reliability

It should be remembered that final data from the survey are based on a weighted sample, rather than the entire UK business population. Percentage results are therefore subject to margins of error, which vary with the size of the sample and the percentage figure concerned.

For example, for a question where 50% of the 1,523 businesses sampled in the survey give a particular answer, the chances are 95 in 100 that this result would not vary more or less than 3.7 percentage points from the true figure – the figure that would have been obtained had the entire UK business population responded to the survey. The margins of error that are assumed to apply in this report are given in the following table.[28]

Margins of error applicable to percentages at or near these levels

	10% or 90% ± (% points)	30% or 70% ± (% points)	50% ± (% points)
1,523 UK businesses	2.2	3.4	3.7
506 micro firms (2 to 9 employees)	3.4	5.6	5.6
479 small firms (10 to 49 employees)	3.1	4.7	5.2
363 medium firms (50 to 249 employees)	3.7	5.7	6.2
175 large firms (250 employees or more)	5.2	8.0	8.7

There are also margins of error when looking at subgroup differences. A difference must be of at least a certain size to be statistically significant. The following table is a guide to these margins of error.

Differences required from overall result for significance at or near these percentage levels

	10% or 90% ± (% points)	30% or 70% ± (% points)	50% ± (% points)
506 micro firms	2.6	3.9	4.3
479 small firms	2.2	3.4	3.7
363 medium firms	3.0	4.6	5.0
175 large firms	4.8	7.3	7.9

[28] In calculating these margins of error, the design effect of the weighting has been taken into account. The overall *effective* base size of the survey was 706 (versus 441 in 2016).

Background note

DCMS commissions and manages the Cyber Security Breaches Survey as part of the National Cyber Security Programme.

Release date: 19 April 2017

Next release: spring 2018

Each year the survey will be reviewed as part of its development. While the majority of the questions will remain the same to enable comparisons over time, as cyber security is a fast changing area we need to ensure the survey remains relevant.

The responsible statistician for this release is Olivia Christophersen. For any queries please contact: 020 7211 2377 or evidence@culture.gov.uk.

We would be interested in any feedback that users have on this release. Please send any feedback to evidence@culture.gov.uk.

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