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Financial Services firms' personal data use – is this leading to bias and detriment for consumers with protected characteristics?

Financial Services Consumer Panel Evidence Review – Final Report

Contents

Executive Summary

1. **It is widely assumed by experts we interviewed in the field, and noted in published literature, that some groups of consumers are experiencing bias and detriment, relating to their protected characteristics, due to the way in which financial firms are using personal data and algorithms.**

2. **There is an *assumption* that the way firms use personal data and algorithms makes it likely that bias is (intentionally or unintentionally) introduced into systems and processes, because:**
   - Algorithms use **historic data** to make decisions about access to products - and consumers with some protected characteristics are already known to more likely be locked out of certain products.
   - There is lots of overlap between people having some protected characteristics and this characteristic being **correlated with data that might be used (by proxy) to assess risk** e.g. postcode, credit history, lower income. The extent to which this data should be used to assess risk brings up moral questions that are currently being debated by experts in financial services and algorithmic governance.

3. **However, this extensive review has found that despite strong anecdotal evidence, categorically evidencing that algorithmic decision-making is the *cause* of bias is challenging because systems are opaque, making it difficult for third parties to truly understand what is happening 'behind the scenes'**. Further, firms don't always have the data they need (e.g. those on protected characteristics) to reverse check decisions made by algorithms, or the comprehensive oversight and technical knowledge about how systems they have procured take decisions.

4. **Due to this complexity, a key finding is that there are important debates to be had about where to draw the line in terms of ethical use of personal data to make risk-based decisions – in terms of what is/isn't fair, reasonable or proportionate?** i.e. insurance pricing on the basis of age, or where the outcomes experienced are due to data such as postcode, as opposed to the specific characteristic that is protected. This issue of fairness is regularly raised but rarely solved in the existing body of evidence. There is a pressing need to raise and address this debate, to generate clear principles in terms of where the criteria for fairness and proportionality lies, as only then can there be clear guidance and regulation in terms of what is and is not acceptable use of data and algorithms in risk-based decision-making by financial services.

5. **Despite this opacity, the evidence review also points to some clear areas of concern:**

   a. **Consumers experiencing unfair bias relating to their ethnicity in terms of access to products, pricing of products and service received.** Whilst much of this evidence currently comes from the USA, recent research has shown that UK consumers are not immune to this. And the evidence shows that outcomes relating to this decision-making are causing detriment to people of colour, such as higher costs, lack of access to products and poorer service.

   b. **Disability is another area where there is evidence of unfair outcomes.** However, this picture becomes more complex for characteristics such as age and gender, where some decisions could be perceived to be fair or proportionate in relation to the risk profile of an individual, or caused by reasonable proxies (i.e. men being charged more for motor insurance but this being because they are more likely to drive cars with larger engines but women with larger car engines would be likely to pay the same, so this may not be about gender, explicitly).

   c. **Evidence about impact in relation to other types of protected characteristics is thinner,** but this doesn't mean it should not remain an area of focus, as the issue may be more the lack of concrete evidence as opposed to this not being an issue. Indeed, a lack of evidence itself is concerning.

6. **Evidence and experts note the critical role that regulation will have in addressing the issues and concerns raised about the use of personal data and algorithms and call for greater pressure on firms to have oversight of personal data and AI they use,** including increasing the onus on firms to evidence that the tools they use to determine access, price and service of their products do **not** cause bias, as opposed to seeking evidence that they **do**.

   a. There is also a desire for there to be further sector leadership in moving the debate forward, as opposed to remaining caught in the circular debate evidenced thus far. What does and should 'fair' look like for consumers?

   b. There is a desire for there to be global conversation, given the global nature of the issue. However, whilst all the jurisdictions in focus for this review are exploring responses to the issue, different jurisdictions are experiencing different challenges, start points and progress – for example, the debate is well established in Australia, but responses are still embryonic; the EU has proposed extending legislation to explicitly address some of the issues raised via the AI

Act, but this is not yet in place; and in the USA progress is being made but there is fragmentation across States.

c. Overall though the nations in scope for this research are deeply interested in addressing the challenge, which is illustrated through key pieces of legislation that centre on AI Governance, but all feel that some aspects are covered better than others. This again illustrates the vital role regulation will have in developing a response further.

7. **The extent of evidence around this topic, anecdotal or otherwise justifies the Panel's concern in this subject.** Expert interviews pointed to the value of ongoing broader debate and activity, such as the setting up of working groups on the subject. The Panel may want to consider partnering with other organisations who also believe this is an important issue to share insight, debate and advocate for the interests of consumers via shared understanding.

"So many people sympathise and say, there is genuinely something wrong here [in relation to use of personal data and algorithms]. But no one wants to stick their head above the parapet and really move it on." - Expert

Chapter 1: Introduction and scope of the research

1.1 Background

The Financial Services Consumer Panel represents the interests of individual and small business consumers in the development of policy and regulation of financial services in the UK. As such they are interested in any changing societal, economic, technological or regulatory context that may negatively impact consumers and specifically where this may lead to harm.

The Panel is aware that firms' collection, management and use of personal data, particularly when combined with algorithms or AI, can lead to different outcomes for different groups.

The fact that people experience variable outcomes when it comes to use of financial services is not disputed: the FCA Financial Lives survey data, for example, shows that women are using high-cost credit more than men (13% vs 8% respectively), and that 16% of those with an 'Other' ethnicity have been declined a financial product in the last two years, compared to 9% Black and 6% White[1]. However, different experiences are not the focus of this review *per se*, but rather how the use of personal data, and particularly algorithms or AI-driven decisions combined with personal data, may have impacted different outcomes and lead to certain groups being unfairly treated or discriminated against.

To this aim, Thinks Insight and Strategy (we) were commissioned to conduct an evidence review complimented by expert interviews focusing on this issue.

We found this to be a complex topic – with experts themselves acknowledging this amidst burgeoning debate. Nevertheless, the review also pointed to a widespread assumption (both in the literature and from experts we interviewed) that there are disparities in use and access of financial services based on some protected characteristics which may be driven (indirectly or directly) by the way data is used by firms[2] even if categorically evidencing the causal link between the two may be elusive. The details of the review are outlined in this report.

1.2 The broader context

Personal data use in financial services

Personal data is information that relates to an identified or identifiable individual, such as a name or an IP address, for example.[3] As we go on to discuss,

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[1] Financial Conduct Authority (2021), 'Financial Lives 2020 Survey: the impact of Coronavirus', *Financial Conduct Authority*
[2] Centre for Data Ethics and Innovation. (2020) 'Review into bias in algorithmic decision-making', *Centre for Data Ethics and Innovation*
[3] Information Commissioner's Office. (no date) 'What is personal data?', *Information Commissioner's Office*

developments in data analytics have made it much easier to relate what may appear to be non-personal data to an identified individual via the use of proxy data and profiling across data sources.[4]

Proxy data refers to the use of personal data - such as people's postcodes, shopping habits, internet browser history and social media use – from which a person's identity including any protected characteristics (e.g. age, gender, ethnicity, or disability) can be inferred. One example which we refer to in this report is outlined here: if a person provides their postcode in an application, and the postcode is in a neighbourhood with a high proportion of ethnic minority residents, the financial service firm's decision-making system could use a consumer's postcode as a 'proxy' for their ethnicity and infer that the applicant is highly likely to belong to an ethnic minority group, subsequently altering the services offered to the consumer on the basis of that inference.

Advances in the use of mobile technology and connected devices has also proliferated the nature of the data that individuals are generating and transmitting.

With the financial services industry becoming ever more data driven, the amount and scope of information held about individuals has significantly increased. This includes:

- **data given directly by the consumer,** such as information to obtain a new product, to aggregate accounts, or to set up new payments;

- **data collected by the service provider**, such as customer records created during customer interactions or from third parties such as credit reference agencies.

Relatively new forms of data analytics, such as data mining, profiling and the use of algorithms or AI, have also led to financial service providers being able to build 'profiles' or infer personal information about an individual based on proxy data, such as past purchase behaviour, social media usage, and credit scores whether they explicitly hold this sensitive information or not. This increased use of different data points used to make decisions about people has also brought questions of how relevant different data is to those decisions.

The use of algorithms and AI in decision-making in Financial Services

Financial service firms rely on data-driven decision-making using a mix of algorithms and artificial intelligence (AI). Data-driven decision-making refers to financial service firms' use of facts, metrics and data to guide the decisions they make about consumers, such as their access to products, coverage terms, and pricing.

An algorithm refers to the process and/or set of rules that a financial service firms' computer system follows in order to make decisions on consumer's requests.

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[4] Organisation for Economic Co-operation and Development. (2020) 'Executive Summary of the discussion on Personalised Pricing in the Digital Era', *Organisation for Economic Co-operation and Development*

Algorithmic decision-making systems rely on the analysis of 'big data' whereby large amounts of personal data is used to make inferences and decisions about the risks consumers present and therefore, what firms will offer them. Humans can be involved in the decision-making but this varies and, in some cases, systems are entirely automated.[5]

Artificial intelligence (AI) is a computer system that can learn and make decisions independently using algorithms, it can take three forms: rule-based learning, machine learning and deep learning. While not all sources in this evidence review differentiate explicitly between algorithmic decision-making and AI decision-making, we reflect on the different types below.[6]

- ***Rule based AI*** reflects its name, using a set of inputs to create rules and make decisions about outcomes, using algorithms. It's best understood as '*if*' formulas: if X is the input then Y is the output. This is felt to be more simple than other AI models, following a cause-and-effect model.
- ***Machine learning*** is a subset of AI, which uses algorithms that work together, changing, adapting and growing in response to different data inputs. So, machine learning happens when a computer uses different inputs to make intelligent decisions. Machine learning is used at large scales and is mutable and adaptable.
- ***Deep learning is a subset of machine learning,*** where algorithms based on highly complex networks used to mimic a human brain work to detect patterns in large unstructured data sets. Models of deep learning can tackle problems that machine learning cannot yet.

These types of AI may be used separately or together and it can be difficult to identify which is being used in the evidence.[7]

Understanding the technicality behind AI is not essential for this review which aims to assess evidence relating to the impact of using personal data and algorithmic decision-making on consumers with protected characteristics. But this may act as a helpful reference where evidence uses different language of AI, machine learning and algorithms, even though the type of AI that may be driving the impacts explored in the evidence reviewed is rarely explicitly defined.

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[5] Castelluccia, Claude, Le Metayer, Daniel (2019) 'Understanding algorithmic decision-making: Opportunities and challenges'. Available at: https://www.europarl.europa.eu/RegData/etudes/STUD/2019/624261/EPRS_STU(2019)624261_EN.pdf (Accessed 28 March 2023).

[6] Smith, Robert (2020) 'The Key Differences Between Rule-Based AI And Machine Learning'. Available at: https://becominghuman.ai/the-key-differences-between-rule-based-ai-and-machine-learning-8792e545e6 (Accessed 13 March 2023)

[7] Smith, Robert (2020) 'The Key Differences Between Rule-Based AI And Machine Learning'. Available at: https://becominghuman.ai/the-key-differences-between-rule-based-ai-and-machine-learning-8792e545e6 (Accessed 13 March 2023)

While this detailed understanding about different AI is not essential, it is important to understand that outsiders 'looking in' on firms' use of AI, e.g. the authors of the literature explored in this work, do not usually know the specifics about the systems a firm is using. This highlights how opaque the use of personal data and algorithms are in financial services, and we will explore the impact of this throughout.

Additionally, it is also worth reflecting at this stage that AI and how it used is not static. Definitions above are reflective of the current moment, but we understand that AI will inevitably change, develop and be able to take on different and more 'advanced' decision making. In doing so, scope for bias, intentional or otherwise also has the potential to shift and increase.

Why does the use of personal data by financial services matter?

As a start point for this review it is important to point out that the literature does refer to some positive benefits from the increasing use of personal data and AI in financial services. For example, benefits may include:

- Enhanced fraud detection due to the ability of AI to monitor real time transactions and detect early warning signals.[8]

- The ability for consumers, who wish to do so, to aggregate their accounts (i.e. via Open Banking) or robo-advice to provide personal plans relating to pensions, savings or other projections.[9]

- More personalised services, where personal data is routinely used for customer profiling and risk assessment (especially in credit and insurance), to ensure consumers are provided with the services, products or tariffs that best suit their circumstances.

However, this review also found that there is also increasing disquiet about the possibilities of harm or unfair treatment that could be occurring due to a reliance on personal data (and specifically algorithms and AI) in financial firms' decision-making about consumers.

What was not in scope – and is a theme often raised in the debate – is a discussion of how consumers themselves feel about their use of personal data and algorithms. Much has been written about this, including previous work for the Panel, with a common perception being that consumers have a shallow understanding of the issue, but are willing to provide their data if it means they get what they perceive will be a better, easier or more personalised product. They rarely assume it will lead to personal detriment or understand there may be a

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8 KPMG (2021) 'Algorithmic bias and financial services', *KPMG*
[9] Organisation for Economic Co-operation and Development. (2020) 'Executive Summary of the discussion on Personalised Pricing in the Digital Era', *Organisation for Economic Co-operation and Development*

'trade-off' involved, whereby if they gain a 'better' deal, someone else may not be able to get the same deal.[10][11]

But rather than a focus on consumer sentiment, we focussed on what evidence there is of potential bias, unfair treatment or harm based on the use of personal data and algorithms, *regardless* of whether consumers are aware of this or not, or what they themselves feel about it.

How this relates to protected characteristics - The Equalities Act (2010)

The Equalities Act (2010) was introduced to protect people from discrimination, both in the workplace and wider society. The Equalities Act brought together over one hundred different pieces of legislation. It covers nine key protected characteristics, including age, disability, gender reassignment, marriage and civil partnership, pregnancy and maternity, race, religion, sex and sexual orientation.[12]

The law outlines that anyone with the above protected characteristics should not be discriminated against and unfairly treated *because* of this characteristic.

This work explores four of the nine protected characteristics in detail: **race/ ethnicity, gender/sex, disability and age**. We are hoping to understand whether or not consumers experience different outcomes in their use of financial services products as a result of the increased use of algorithms and personal data in this industry and, if these differing outcomes result in harm.

We acknowledge that there is a range of protected characteristics that goes beyond this list, but as the evidence was even thinner in relation to these and given the nature of intersectionality (that everyone will represent a range of different characteristics), we have focused on these four key characteristics due to these being where there was a greater body of evidence, without overlooking the fact these are not the only characteristics that can matter or drive bias and discrimination.

1.3 Research questions and objectives

Having set the scope for this review, the specific questions we set out to address are as follows:

- Is there evidence that the use of personal data and algorithms, by financial service providers, is leading to unfair, biased or discriminatory outcomes for consumers with protected characteristics?

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[10] Thinks Insight and Strategy (2019) 'Consumer's attitude to data and insurance', *Thinks Insight and Strategy*
[11] Financial Services Consumer Panel (2018) 'Consenting Adults? – consumers sharing their financial data', *Financial Services Consumer Panel*
[12] Legislation.gov.uk (2010) 'Equality Act 2010' Available at: http://www.legislation.gov.uk/ukpga/2010/15/contents (Accessed 13 March 2023)

- Is there evidence that consumers of financial services with protected characteristics are being disadvantaged or treated unfairly, either directly or indirectly (such as paying more or accessing products less)?
- And if so, is this caused by the use of personal data and algorithms? And is this leading to consumer harm or negative outcomes for particular groups?

On a more granular level, we reviewed the evidence against four specific hypotheses, to understand whether:

- Consumers with protected characteristics experience bias in the likelihood of being **accepted or rejected** for specific financial services products.
- Consumers with protected characteristics experience bias in the **pricing of financial services products they access or are offered** (i.e. are consumers with protected characteristics being charged a higher price than those who do not have those characteristics?).
- Consumers with protected characteristics experience bias in **other terms** (including, for example, the level of cover) they are offered for financial services products (i.e. are consumers with protected characteristics receiving less value than those who do not have those characteristics?).
- Consumers with protected characteristics experience **bias in the outcomes or treatment they receive in relation to financial services products** including, inter alia, speed of claims payments, level/appropriateness of claims payments, bad debt and arrears management, complaints handling and service delivery.

1.4 Approach to the evidence review

In summary: more detailed explanation of methodology and approach to be found in [Appendix 3: Methodology in detail.](#)

The geographical scope for the project is the UK, but we also consider evidence from Australia, Canada, the USA, and Europe, exploring examples of bias and best practice. These markets were selected by the Financial Services Consumer Panel at the brief stage, given their relative similarities to the UK.

The review aimed to include a range of financial products, with a focus on insurance, credit and mortgage products. Products are key to consumers' financial lives, and with more and more technology being used in decision-making about these specific products, these are logical starting points for this evidence review.

As explained above, we focus on the following protected characteristics: sex/gender, race/ethnicity, age and disability. The latter three were all outlined in the brief for this work by the Financial Services Consumer Panel as key areas of

interest. We also included gender, given women often have different relationships with finance, including access to products compared to male counterparts.[13]

The report outlines findings from the following evidence:

- 67 written sources (see appendix for details),
- Eight interviews conducted with experts, with representation from the UK, Canada, Australia, the USA and Europe.

1.5 Structure of the report

First, in Chapter 2, we address the big question – is the use of personal data and algorithms leading to bias? In exploring this we also cover the debates, challenges, and direction of travel for conversations around the use of personal data and algorithmic decision-making, and how this could be leading to bias by financial firms towards people with protected characteristics (directly or indirectly).

Then, in Chapter 3, we explore the evidence available to help us answer the key research questions, providing an overview of evidence relating to specific protected characteristics, and pointing to areas where there are specific concerns about biased or unfair treatment that may require urgent focus, further research and more discussion for those interested in the impact of personal data and algorithmic decision-making in financial services.

Following this discussion, in Chapter 4, we reflect on this being a social and global issues and one in which regulation will have a vital role to play in addressing in the future, reflecting on learnings from other jurisdictions and potential next steps for the Panel to consider in terms of their advocacy.

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[13] Financial Conduct Authority (2021), 'Financial Lives 2020 Survey: the impact of Coronavirus', *Financial Conduct Authority*

Chapter 2: Answering the big question: is the use of personal data and algorithms leading to bias? Considerations, challenges, and debate around this question

The core research question: **'does the use of personal data and AI result in bias or unfair outcomes for people with protected characteristics?'** is not simple or straightforward to answer. Evidence and debate on this subject highlight complex issues that must be considered.

The chapter below outlines findings from expert interviews and evidence, exploring the debates in detail, including discussion around *the epistemological nature* of the evidence that should be taken into account, and the role of proxy data.

The chapter concludes that: **yes, people with protected characteristics are likely to be experiencing bias outcomes which can cause potential harm, certainly indirectly** if not in some cases directly, for some people with protected characteristics based on the outcome of using personal data and algorithmic decision-making. However, proving a causal link can be difficult.

We bring in the voice of experts interviewed, who say there is enough 'smoke' for this to be a concern – but the fire isn't easy to locate or to put out. So, we also point to a key challenge and debate explored in this review - there are important debates to be had about where to draw the line around outcomes experienced by different groups, reflecting on what outcomes are more or less fair, reasonable and proportionate when making assumptions about risk using personal data.

2.1 The nature of the evidence

In this evidence review, we set out to find what, if any, empirical evidence there is that biased outcomes are occurring for people with protected characteristics due to how their personal data and algorithms are used. We did find evidence that suggests this to be the case, outlined in Chapter 3.

However, the evidence can be thin with the same examples or case studies often cited as the 'proof' that bias is occurring. According to some of the experts we interviewed, there has been sector wide interest in the Citizens' Advice research from 2022 which explores discriminatory pricing for Black consumers buying insurance. It is one of the few studies that firmly illustrates the relationship between algorithms and biased outcomes through its mystery shopping technique[14] (despite some expert and sector reservations about replicability):

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[14] Cook, Tilly., Greenall, Aiden., and Sheehy, Emer. (2022) 'Discriminatory Pricing: Exploring the 'ethnic penalty' in the insurance market' *Citizens Advice*

> *"You know I'd think there would be more evidence and pieces out there about it. I've been looking out for them because I'm interested in this, and I don't see lots on it." - Expert*

However, anecdotal experience can be a valuable indicator of trends, behaviour and harm. Experts point to historical cases in the financial services sector, where early warning signs and anecdotal evidence of price discrimination and bias have been ignored by firms. One example cited by several experts centred around discriminatory pricing for LGBTQ people trying to access health insurance during the AIDs crisis.

So, experts urge regulators and decision makers to stay interested in the subject of personal data and algorithmic decision-making even without a plethora of robustly empirical evidence that may prove causation. Experts see this as learning from history, where often consumers groups have been at the fore of highlighting concerns over bias:

> *"Price discrimination isn't anything new, it's just new things and new examples [due to algorithms being used in decision-making that are driving it]. When HIV was rife, insurers were charging LGBT people more, seeing people as more risky." - Expert*

2.2 The role of proxy data: intersectionality makes evidencing cause and effect challenging

One topic that emerged frequently during the review is the issue of proxy data, whereby personal data is used to make decisions about an individual's access, price and experience using a product. Evidence tells us that it may be the case that some bias experienced by people with protected characteristics in financial services is because of their socio-economic status or circumstances, which leads to a thin or impaired credit file or higher risk profile, as opposed to the actual characteristic that is protected.[15] As such, it could be argued that financial firms and industry are not specifically discriminating against key characteristics outlined in the Equalities Act, but are rather responding to people's financial profile which is an accepted practice.

However, the fact that many characteristics (e.g., ethnicity, disability and gender) can intersect with some socio-economic circumstances means that people with certain protected characteristics may be more likely to experience financial detriment and social exclusion.

This can lead to an argument that these risk-based decisions *are* negatively impacting people due to their protected characteristics, because some groups are

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[15] Davies, Sara., and Collings, David. (2021) 'The Inequality of Poverty: Exploring the link between the poverty premium and protected characteristics', *Personal Finance Research Centre*

known to be more likely to experience financial detriment, and this may be caused by entrenched social structures of discrimination whereby unfair judgements are made about people linked to their characteristics (i.e., ethnicity, gender, or disability).

These debates are complex, and evidence and experts point to it requiring further research and discussion from regulators in FS, specifically to understand what personal data and outcomes are felt to be justified, proportionate and fair when decisions have been made about risk.

Experts themselves also acknowledge that this correlation leads to a complex situation where a clear line around what is fair or unacceptable may be difficult to draw:

> *"Income is a relevant factor when it comes to decisions about loans. Income is also correlated with many protected characteristics as we've discussed. So, when it comes to the decision, it isn't about one or the other, there is overlap, and it's about both. So, you have to question then is it relevant to use income? You have to be accepting of the fact that it is correlated with these other things. Then you have to say is that sufficient enough reason to use it or not to use it?" - Expert*

Firms could also argue that they don't know which protected characteristics a consumer has when making decisions about customers based on their financial circumstances, credit rating or risk profile. However, experts reject this stance overall, saying that firms can and do often have a very good idea about someone's identity through using proxy data about them.[16] This can be as simple as data about where a consumer buys clothes for example or specific information about credit ratings. Proxy data is used to build a profile of consumers and inform decisions made about them such as marketing they receive, and this is likely to include codes or proxies about protected characteristics.[17]

> *"At the moment, firms can and do use proxy data for different things. Say taking decisions about your shopping basket. There is clearly no causality between what you buy in the grocery store and your propensity to have a car accident. You know, like shopping baskets don't have a relationship with risk in our minds, there's just no relation. But, you know, algorithms might be able to draw statistical correlations. And so, it might end up meaning something completely different than what you think it*

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[16] European Union Agency for Fundamental Rights (2018) '#BigData: Discrimination in data-supported decision-making', European Union Agency for Fundamental Rights
[17] European Union Agency for Fundamental Rights (2018) '#BigData: Discrimination in data-supported decision-making', European Union Agency for Fundamental Rights

does [knowing what someone buys and who they are]. It's building a profile." - Expert

It isn't necessarily the protected characteristic itself that leads to the outcome experienced, but the proxy data used – nevertheless given the opaque nature of understanding which data is used by algorithms, and how it makes decisions, it cannot be stated categorically that the outcome experienced is **not** due to data on the protected characteristic either.

So, whilst correlation is not the same as causation, there is clearly concern that people are being treated differently due to the data held about them and the way this is used, which could directly or indirectly lead to a protected characteristic being one factor that has led to, or correlates, with this outcome.

With these concerns brings calls for greater understanding about what data is being used, how it is being used, and why it is being used to make decisions about people[18]. Proxy data is a key part of this conversation about transparency.

2.3 Are different 'outcomes' sometimes justified?

There are moral philosophical questions relating to fairness (or unfairness) that overlap with this exploration of evidence that bias is caused by how personal data and algorithms are being used.

Insurance provides a perfect example, whereby there is a growing movement towards more personalised (as opposed to pooled risk) modelling and pricing.[19] For some people, this leads to cheaper insurance, and arguably a 'better outcome'. Nevertheless, experts and academics question how *fair* this trend is when it also means higher costs for others.[20] Experts and published evidence raise the conundrum: how to decide what is fair? Especially where characteristics logically feel 'riskier', such as older people obtaining health insurance and therefore higher prices. Deciding where to draw the line and where it becomes 'harmful' or unfair in some of these decisions is challenging but felt to be a pressing area of focus:

"Lots of regulation and focus should be on insurance and risk in this space. These questions are big and social: what is right? Is discriminating against older people for life insurance okay? Do we care? But maybe we do if it's about their home insurance. It makes it complicated to think about the justifications of why we

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[18] Prince, Anya E. R. and Schwarcz, Daniel. (2020) 'Proxy discrimination in the Age of Artificial Intelligence and Big Data', *Iowa Law Review* 105(3)

[19] Ostmann, Florian., and Dorobantu, Cosmina. (2021) 'AI in financial services', *Alan Turing Institute*

[20] Minty, Duncan. (2023) 'The Fairness of Insurance Pricing is Challenged Again', *Ethics and Insurance,* 21 February 2023. Available at: https://www.ethicsandinsurance.info/the-fairness-of-insurance-pricing-is-challenged-again/ (Accessed 27 February 2023)

don't indeed if we don't care about these things [different outcomes]." - Expert

"You know there are certain diseases that some people are more predisposed to, which can fall out on different lines [be overly represented in some groups]. Are we allowed to charge more to those folks or not, if they are more likely to have a disease?" - Expert

"Maybe it isn't wrong that young people pay more car insurance. But it's about where you draw that line [of fairness]." - Expert

There are some 'red lines' identified in the evidence we have explored. For example, the point at which consumers are denied access to insurance completely, as opposed to more expensive insurance, is felt to be genuinely detrimental and harmful (as explored in more detail in Chapter 3).

Whatever the line, experts we have heard from in the UK context say it is not enough to wait for the Consumer Duty to take effect, since 'good outcomes' for consumers differ and fairness is integral to what makes a good outcome. They, and other consumer groups, want to see the FCA and others address and debate the question of fairness and morals in decision-making for these risk-based products such as insurance.[21]

Further, though there is a trend towards more personalised prices, this is not a foregone conclusion - other nations are doing things differently. Ireland and Australia still see higher levels of pooling in insurance for example. 'Pooled risk' is when individuals pay the same premium for the same insurance plan regardless of risk status, as opposed to discriminatory pricing in other markets which allows for a difference in premiums based on differences in characteristics. Looking further afield can challenge what is deemed as acceptable or unacceptable in terms of pricing, due to cultural and market contexts.

2.4 Why bias is assumed

The evidence and experts also tended to assume that bias or unfair outcomes and treatment is likely to be happening relating to some protected characteristics, based on what is known about how AI/ algorithms use personal data and how they are developed, coded and managed. Furthermore, these drivers of bias tend to be undisputed - data scientists know these problems exist but say firms claim they are difficult to change, as they are so embedded within systems[22]. Even Chat GPT, an AI chat bot (popular at the time of writing), which uses sources from the

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[21] Cook, Tilly., Greenall, Aiden., and Sheehy, Emer. (2022) 'Discriminatory Pricing: Exploring the 'ethnic penalty' in the insurance market' *Citizens Advice*
[22] Swedloff, Rick. (2019) 'The New Regulatory Imperative for Insurance', Boston College Law Review 105(3)

internet to answer users' questions states AI and algorithms used in decision making can lead to bias outcomes - showing the prevalence and accepted nature of this theory (see appendix 2).

> *"Firms can hide behind opaqueness in their practises and say 'it's opaque because it's sophistication' you know so not everyone will understand it. Or they say 'it's how the algorithm works'…hmm, they can say all that but I don't always buy that." - Expert*

Drivers of bias include:

- **Incomplete or out-of-date data used as inputs.** Some profiles having lots of missing data which means algorithms can oversteer in decisions about things like risk portfolio in insurance and credit. This is especially the case where some groups we have looked at can be 'locked out' of the financial system, so historic data will not be in place to inform decision-making.[23]

- **A lack of oversight over how algorithms may embed bias,**[24] with organisations often being without a designated lead holding ultimate responsibility for this.

- **An inability to reverse check whether bias is occurring.** Firms often do not ask consumers questions about protected characteristics, due to the Equalities Act 2010 and the belief that this is sensitive information. Where it is necessary, firms are often nervous about doing so for fear of being reprimanded. This means there is often no easy way for firms to retrospectively check if their algorithms are *causing* bias to people with these characteristics as the proxy data may cause this indirectly.[25][26]

- **Model opacity** which means algorithm inputs and outputs can be difficult to understand and therefore difficult to spot bias in.[27]

- **Proxy data** where algorithms make decisions based on data that can represent other characteristics.[28]

- **Bias in algorithm design** where past human bias is embedded into the design of algorithms, further entrenching bias.[29]

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[23] Centre for Data Ethics and Innovation. (2020) 'Review into bias in algorithmic decision-making', *Centre for Data Ethics and Innovation*

[24] Cook, Tilly., Greenall, Aiden., and Sheehy, Emer. (2022) 'Discriminatory Pricing: Exploring the 'ethnic penalty' in the insurance market' *Citizens Advice*

[25] Financial Conduct Authority. (2020) 'Pricing practices in the retail general insurance sector: Household insurance', *Financial Conduct Authority*

[26] Centre for Data Ethics and Innovation. (2020) 'Review into bias in algorithmic decision-making', *Centre for Data Ethics and Innovation*

[27] Ostmann, Florian., and Dorobantu, Cosmina. (2021) 'AI in financial services', *Alan Turing Institute*

[28] European Union Agency for Fundamental Rights (2018) '#BigData: Discrimination in data-supported decision-making', European Union Agency for Fundamental Rights

[29] European Union Agency for Fundamental Rights (2018) '#BigData: Discrimination in data-supported decision-making', European Union Agency for Fundamental Rights

Chapter 3: No 'smoke' without fire: Evidence of biased outcomes by protected characteristic

This chapter shares specific evidence of biased outcomes (which may be direct or indirect) against each of the key protected characteristics focused on. We have found that a key area of concern could be ethnicity and the way in which data use may be leading to discrimination against people of different ethnicities. We have also found that disability may also be a key protected characteristic of concern especially when considering disabled peoples' access to and price paid for insurance products.

We also summarise other additional evidence points relating to protected characteristics out of scope for this research at the end – though this evidence tended to be thinner. This does not mean discrimination does not occur, but lacks current focus and evidence.

3.1 Ethnicity/race

The story: ethnic minority consumers are facing bias in financial service outcomes because of how personal data is being used

Financial service firms' use of personal data and algorithmic decision-making is leading to bias and discriminatory outcomes for people from ethnic minority backgrounds.

Evidence for this problem is found both in the USA and the UK, and across key financial products: credit, mortgages, and insurance. It tells us ethnic minority consumers are struggling to access the products they need or receive the right amount of the product e.g. credit or cover. And when they do, they are often paying more for them.

A landmark legal case currently ongoing in the USA also explores how Black people receive different treatment by financial firms when claiming for insurance.[30] All of this points to a concerning picture where bias and harms may be occurring because of firms using personal data and algorithms across nations and financial services product types.

The evidence

Personal data use means ethnic minority consumers are not accessing the insurance, credit or mortgage products they need

There is hard, empirical evidence that tells us consumers from ethnic minority backgrounds are locked out of financial service products compared to White

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[30] Flitter, Emily. (2022) 'New Suit Uses Data to Back Racial Bias Claims Against State Farm', *New York Times*, 14 December 2022. Available at: https://www.nytimes.com/2022/12/14/business/state-farm-racial-bias-lawsuit.html (Accessed 15 February 2023)

counterparts. For example, there has been a decline in Black consumers' access to banks, with an almost 15% decrease in the number of banks in black neighbourhoods between 2010 and 2018 in the USA. [31] But the picture in the UK also shows similar challenges, with Black families being overrepresented amongst the unbanked.[32]

We know algorithms and data, such as credit ratings, are used to make decisions about what products consumers are able to access, so not having accessed products in the past will then impact current and future access.[33] Research in the USA theorises that machine learning in financial services using personal data not only exacerbates, but accelerates ethnic inequality in finance.[34] In a USA study of 3.2 million mortgage applications and 10.0 million refinance applications to Fannie Mae and Freddie Mac (federal state backed mortgage companies in the USA), it was found that Latinx and African American applicants faced a rejection rate of 60.6% compared to 47.6% of White applicants.[35]

And where ethnic minority consumers are accessing credit, it's not at the same level as white counterparts

Even where Black consumers are accessing the products they need, it's not always at the same level (e.g. the same amount of cover or credit available) as their White counterparts, which points to further discrimination and potential harm. The USA again is home to examples. Between 1996 and 2012 residents in Baltimore city, a majority Black area, were granted smaller loan to income ratios than those in White areas.[36] This case shows the impact of postcode in taking decisions about who can access products, showing personal data resulting in indirect disadvantage and unfair treatment. As outlined in Chapter 2, it may be that these decisions are due to postcode and not ethnicity data, but the outcome is that Black people are being discriminated against indirectly.

Postcode data used by algorithms contributes to higher prices for ethnic minority consumers

What happens when ethnic minority consumers can access the products they need? The story here tells us that ethnic minorities are paying more for the same products and services than White counterparts. Here, algorithmic decision-making

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[31] Broady, Kristen., Mccomas, Mac., and Ouazad, Amine. (2021) 'An analysis of financial institutions in Black-majority communities', *Brookings Institution*
[32] Solomon Y. Deku, Alper Kara & Philip Molyneux (2015), 'Access to consumer credit in the UK', *The European Journal of Finance*
[33] Batler, Laura., and Nelson, Scott. (2021) 'How Costly is Noise? Data and Disparities in Consumer Credit', ArXiv abs/2105.07554
[34] Weber, Mark., Yurochkin, Mikhail., Botros, Sherif., and Markov, Vanio. (2020) 'Black Loans Matter: Fighting Bias for the AI Fairness in Lending', *MIT-IBM Watson AI Lab*
[35] Weber, Mark., Yurochkin, Mikhail., Botros, Sherif., and Markov, Vanio. (2020) 'Black Loans Matter: Fighting Bias for the AI Fairness in Lending', *MIT-IBM Watson AI Lab*
[36] Broady, Kristen., Mccomas, Mac., and Ouazad, Amine. (2021) 'An analysis of financial institutions in Black-majority communities', *Brookings Institution*

and personal data are contributing to the bias. In 2022 the UK consumer organisation, Citizens' Advice released a landmark paper exploring how much Black and South Asian people pay for their car insurance in the UK.[37] And, this research was updated by Citizens Advice in 2023 showing the same issue is *still* occurring.[38] The mystery shopping exercise revealed that when consumers input postcodes with higher percentages of Black and South Asian residents, their quotes for car insurance were £280 more than for postcodes with predominantly White residents.[39] This type of exercise has been criticised by some, because mystery shopping exercises are hard to replicate and using 'fake customer' profiles to receive quotes can trigger systems to start responding to fraudulent activity. This could mean quotes are not actually representative of what 'real consumers' would receive. However, there is still evidence of different outcomes. Citizens Advice continued this research, analysing their own customers, to look into who used Citizens Advice for debt support. Researchers found that among this audience, people of colour had spent an average of £250 more than White people for car insurance. Analysis showed this premium was independent of gender, age, income or disability.

This paper isn't the only evidence of postcode data leading to disparity in prices for financial services between White consumers and ethnic minority consumers. Research in the USA with major car insurers found that they were charging premiums that were on average 30% higher in zip codes with a majority of ethnic minority residents than in majority White neighbourhoods. The premiums remained disproportionately high for ethnic minority customers, even when controlling for risk and similar accident costs across the neighbourhoods.[40]

When it comes to claiming, a landmark case says ethnic minority consumers are not receiving fair treatment because of algorithmic decision-making

Black consumers are also facing barriers to claiming on insurance and accessing pay-outs. In the USA, there is currently a landmark case being filed against State Farm (one of the USA's biggest insurance firms), for racial discrimination.[41] The lawsuit builds on a study conducted in 2021, which found Black claimants were

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[37] Cook, Tilly., Greenall, Aiden., and Sheehy, Emer. (2022) 'Discriminatory Pricing: Exploring the 'ethnic penalty' in the insurance market' *Citizens Advice*
[38] Hann, Chloe., Lynn, Emily., Kalombo, Naomi., Cook, Tilly. (2023) 'Discriminatory Pricing: One Year On' *Citizens Advice*
[39] Cook, Tilly., Greenall, Aiden., and Sheehy, Emer. (2022) 'Discriminatory Pricing: Exploring the 'ethnic penalty' in the insurance market' *Citizens Advice*
[40] Angwin, Julia., Larson, Jeff., Kirchner, Lauren., Mattu, Surya., and ProPublica (2017) 'Minority Neighborhoods Pay Higher Car Insurance Premiums Than White Areas With the Same Risk', *ProPublica,* 5 April 2017. Available at: https://www.propublica.org/article/minority-neighborhoods-higher-car-insurance-premiums-white-areas-same-risk (Accessed 12 February 2023)
[41] Flitter, Emily. (2022) 'New Suit Uses Data to Back Racial Bias Claims Against State Farm', *New York Times*, 14 December 2022. Available at: https://www.nytimes.com/2022/12/14/business/state-farm-racial-bias-lawsuit.html (Accessed 15 February 2023)

likely to have more conversations with State Farm and fill in more paperwork before having their claims approved, and after that, waiting even longer to receive pay-outs. The prosecution states the increased use of personal data and algorithmic decision-making to decide outcomes for claims in these cases is a key driver for these different, and biased outcomes. Finally, research separate to the lawsuit and original study has found evidence of State Farm placing Black customers in lower quality emergency accommodation than White customers in incidents where they have had to be rehoused by insurers.[42] This is a landmark case, which is being followed closely by experts in the industry. Its outcome is likely to give robust evidence to deep held concerns about the use of personal data in the insurance sector when decisions are being made about claims.

Conclusions

If there is a 'fire' discovered in this research that requires immediate action to tackle, the impact of personal data and algorithmic decision-making for ethnic minority consumers' outcomes is probably it. Both the Citizens Advice work and State Farm lawsuit are two of the key and most important pieces of clear evidence of biased outcomes across a plethora of metrics and are core to the conversation about any bias in decision-making based on personal data by algorithms.

Though it often appears to be postcode data that is ostensibly leading to this bias, the fact that this is leading to poorer outcomes and services for people of colour is clearly evidenced. Whilst much of this evidence is currently found in the USA, the Citizens Advice research shows the UK is not immune to similar issues – and so, further work is required to explore and address these issues in the UK context.

These key pieces of evidence will likely bring up some of the questions outlined in chapter 2, seeking to further understand what justifiable and reasonable personal data is to use when taking decisions about consumers. Some may argue that postcode data is an important data point in determining risk whereas others may question the relevance of this practise, and the fairness of the outcomes it produces.

Drawing the lines in the sand continues to present moral challenges and conversations and debate needs to be had about not only postcode data, but other personal data points that might lead to different outcomes for people from different ethnic identities.

3.2 Disability/health status

The story: disabled consumers are facing bias in the insurance market because of personal data and algorithmic decisions

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[42] Flitter, Emily. (2022) 'New Suit Uses Data to Back Racial Bias Claims Against State Farm', *New York Times*, 14 December 2022. Available at: https://www.nytimes.com/2022/12/14/business/state-farm-racial-bias-lawsuit.html (Accessed 15 February 2023)

Disability and health status is a very important protected characteristic to consider in this review. Indeed, evidence has found that disabled consumers and consumers living with mental health conditions are facing barriers to access the amount of insurance they need, and when they do, are paying more than other consumers.[43][44]

From the evidence reviewed, disabled consumers, and those living with long term health conditions are aware their personal health data can result in them struggling to access and pay a reasonable price for insurance.[45]

The evidence

It's legal to use personal data about disability to make insurance decisions, but is it right?

Insurance companies are legally allowed to treat people with health conditions differently when it comes to pricing and level of cover, but this has to be 'backed up' by reliable and relevant actuarial data, related to risk. However, insurers are often asking fewer questions about people at quote stage, with the intention of streamlining the application process. In doing so, they rely on third party data to paint a picture of the applicant making it difficult to know whether data is reliable and relevant.[46] And, they are likely making assumptions about the individual.

This brings into question what counts as actuarially relevant personal data, which is important as a moral question here. One example is how some insurance firms argue that a prior application for anti-depressants is relevant information for an application to a product. At the same time, this also points to a consumer managing their health problem.[47] The picture is complex and again brings questions about the lines between what is fair, reasonable and justified in terms of outcomes.

The result as it stands? People with disabilities feeling as though assumptions are being made about their conditions instead of their personal circumstances being taken into account. 16% of disabled people refrain from even applying for travel insurance, anticipating these outcomes, leaving them without cover.[48] This is extremely concerning, and points to the potential for direct harms for people who are more likely than non-disabled people to need support abroad.

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[43] Scope. (2017) 'Improving access to insurance for disabled people', *Scope*
[44] Lees C. (2023) 'Written Off? Making insurance work better for people with mental health problems' *Money and mental health policy institute*
[45] Scope. (2017) 'Improving access to insurance for disabled people', *Scope*
[46] Minty, Duncan. (2023) 'The Fairness of Insurance Pricing is Challenged Again', *Ethics and Insurance,* 21 February 2023. Available at: https://www.ethicsandinsurance.info/the-fairness-of-insurance-pricing-is-challenged-again/ (Accessed 27 February 2023)
[47] Minty, Duncan. (2023) 'The Fairness of Insurance Pricing is Challenged Again', *Ethics and Insurance,* 21 February 2023. Available at: https://www.ethicsandinsurance.info/the-fairness-of-insurance-pricing-is-challenged-again/ (Accessed 27 February 2023)
[48] Scope. (2017) 'Improving access to insurance for disabled people', *Scope*

There is going to be an increased focus on mental health in this space

Mental health is a particularly pertinent subset of health and access to insurance products. New evidence in the UK from the Money and Mental Health Institute explores experiences of people with mental health conditions accessing insurance, and has been backed by Martin Lewis, a leading finance journalist in the UK.[49] This high-profile advocate points to rising interest on this subject in the mainstream, especially as one in four are likely to experience mental health issues in their lifetime.[50]

Disabled people are not accessing the products they need

Disabled people across the markets explored in this evidence review are struggling to access the products they need. This is likely to be due in part to the combination of personal data and algorithmic decision-making. According to one expert we heard from, when disabled people get a quote from insurers, firms are using algorithms to offer very high prices to price them out of the product, or worse, denying them access to products completely. Proving the practise is challenging, as firms are unlikely to be asking specifically about disability, but technically using other personal data to make assumptions about a consumers' risk and therefore decisions about whether or not to offer a product. Whether this can be proved from firms' data collection or not, the outcomes that disabled consumers report points to discrimination, with consumers reporting they are experiencing different outcomes from non-disabled counterparts.[51]

There is hard evidence too that disabled people are being underserved in insurance specifically. In 2019, a legal aid organisation in Australia found in a survey of people living with health conditions, the majority had struggled to access the life insurance they need. Some said this is because the insurer wouldn't offer them a product, or they struggled to identify a policy that suited their needs.[52]

The number of claims made by disabled people doesn't match the high prices they pay

Despite disabled people struggling to access and afford insurance, they aren't necessarily making more claims. In the FCA financial lives survey, there is little difference in the proportions of claims between people with and without mental

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[49] Lees C. (2023). 'Written Off? Making insurance work better for people with mental health problems' *Money and mental health policy institute.*
[50] Minty, Duncan. (2023) 'The Fairness of Insurance Pricing is Challenged Again', *Ethics and Insurance,* 21 February 2023. Available at: https://www.ethicsandinsurance.info/the-fairness-of-insurance-pricing-is-challenged-again/ (Accessed 27 February 2023)
[51] Lees C. (2023). 'Written Off? Making insurance work better for people with mental health problems' *Money and mental health policy institute.*
[52] Legal Aid NSW (2019) 'What's the Risk? Access to insurance for people living with health conditions', *Legal Aid NSW*

health conditions across products including motor, home and travel.[53] As a result, there is not a significant indication that people with mental health problems are more likely to claim.[54] However, research shows people with mental health conditions are becoming reluctant to disclose their condition to their insurance providers for fear of disproportionate premiums.[55]

There are barriers to claiming for disabled people, but it's not necessarily due to their personal data being used

When it comes to potential harm or bias in the claims process, disabled people and those living with mental health conditions are facing barriers to claiming. From the evidence reviewed, these barriers tend to focus on consumers' experiences in making claims e.g. it being daunting, or firms making it challenging by using lots of complex information. This has less to do with algorithms and data. However, the outcome of State Farm, which says ethnic minority consumers are experiencing greater challenges making successful claims *because of data* could push this debate amongst disabled consumers.

Conclusion

Evidence that bias, due to health/disability is occurring, comes from a number of jurisdictions. As explored in Chapter 2, there are interesting ethical debates about what constitutes fairness and how insurance risk should be calculated. If disability or health conditions are drivers of greater risk, does society feel using this information is justified and reasonable. Evidence tells us outcomes do differ for disabled people in terms of access and price in insurance, and it requires further research and debate to better understand how proportionate, or fair these outcomes feel.

An important viewpoint to consider will be those of disabled people. Evidence tells us people with disabilities do feel demonstrably that they are being discriminated against – to the point some even go without insurance products at all. This means these consumers could be facing detriment at the time they need support the most, being uninsured in the event of an emergency.

The concern disabled consumers have about being unfairly judged could also be spilling over into other financial products beyond insurance, and is an area for potential future study to fully understand the extent disabled consumers count themselves out for fear of being rejected or penalised by financial services providers.

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[53] Financial Conduct Authority (2021), 'Financial Lives 2020 Survey: the impact of Coronavirus', *Financial Conduct Authority*
[54] Lees C. (2023). 'Written Off? Making insurance work better for people with mental health problems' *Money and mental health policy institute.*
[55] Minty, Duncan (2023). 'The Fairness of Insurance Pricing is Challenged Again' *Ethics and Insurance,* 21 February 2023. Available at: https://www.ethicsandinsurance.info/the-fairness-of-insurance-pricing-is-challenged-again/ (Accessed 27 February 2023)

3.3 Age

The story: some people are facing bias in terms of accessing and price of the insurance products they need due to age, though at times this may be justifiable

The story for older consumers is focused on insurance products, with travel, health and motor insurance more difficult or costly to obtain in later life. Insurers are using personal data about age to make decisions about offering, and pricing premiums. As with disability, this is not illegal in the UK.

Personalised pricing is affecting older people: but it's not the case globally

There is a trend towards more personalised pricing, as explored in Chapter 2, which is indeed something that consumers themselves would welcome when it comes to feeling they have the right product for them[56]. So, personalisation in itself is not necessarily wrong, but what is required is greater engagement with the issue that if one individual 'benefits' from lower costs or better cover someone else may be receiving higher costs or less cover due to their personalised risk profile. In addition, greater personalisation is not the only model available. For example, other nations, including Ireland and Australia have more pooled health insurance which leads to greater equity in cost and cover for all, but it could be argued at the expense of personalisation.[57][58]

Age in insurance also presents a challenging moral question with experts in this sample also reporting that age can feel a 'fair' reason to assess risk, speaking to the Panel's key research question about what constitutes an unfair outcome.

The evidence

Older people are struggling to access insurance, and pay more for it when they do: it's well evidenced

There is a large bank of evidence showing that older people are paying more for insurance. In 2021 consumer group Which? found that 20% of insurance providers they surveyed had maximum age restrictions for new car insurance customers aged 85 or lower.[59] These upper age limits mean that certain car insurance providers do not offer new policies to drivers over a certain age. For instance, Aviva does not offer new policies to drivers aged 85 or over whilst the Co-op only

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[56] Finance & Leasing Association, The Future of Credit, 2023 file:///Users/carol/Downloads/fla-future-of-credit.pdf

[57] Keegan, C. (2020) 'The introduction of lifetime community rating in the Irish private health insurance market: Effects on coverage and plan choice', *Soc Sci Med* 255(1)

[58] Keegan, C. (2020) 'The introduction of lifetime community rating in the Irish private health insurance market: Effects on coverage and plan choice', *Soc Sci Med* 255(1)

[59] Hayward, Sue. (2021) 'How rising car insurance premiums and age limits are leaving older drivers reeling', *INews*, 29 May 2021. Available at: https://inews.co.uk/inews-lifestyle/money/car-insurance-premiums-rising-age-limits-older-drivers-1024830 (Accessed 15 February 2023)

quotes people aged up to 75 years old, unless they are an existing customer. It is therefore worth noting that the upper age limits imposed by car insurance companies apply to *new* customers only. This can feel arbitrary to consumers, as not all those aged 75 present the same risk, and all present different risks that may be due to other factors beyond age.

Providers such as Aviva, Co-op, Direct Line and Churchill still offer cover at renewal for existing policyholders regardless of age. However, the limited scope for older drivers to switch their car insurance providers as they get older means they are more likely to be affected by the so-called 'loyalty penalty' (see later in this chapter).

Importantly, this study also showed evidence of age discrimination in insurance pricing is starting even earlier for consumers. In the UK some insurance companies are not offering to cover certain age categories, sometimes for ages as low as 65 years old. This study, alongside the Citizens Advice work, demonstrates that consumer groups are at the forefront of the conversation about this subject.

Some are paying for a product they don't even receive

Even if some can empathise with insurers being reluctant to cover older citizens, there is still some evidence of what could be seen as unreasonable behaviour.

In addition, some older consumers may miss out on benefits associated with other accounts they have relating to financial products due to their age, including insurance, even though they may believe they are covered.[60] This is shown in cases where banks automatically strip a consumer's cover at a certain age, which has been a benefit they received as part of a 'bundle' as part of their account. Now the customer still has to pay the same monthly fee for fewer benefits or switch accounts, as well as find new cover.

Prices are higher, and they increase steeply with age

Those in the financial services sector know that as consumers age, price rises hike rapidly for insurance products. For example, travel insurance premiums rose for everyone during the Covid-19 pandemic, however increases were disproportionately higher for older customers, with 25-54 years olds paying 33% more for cover, 75-84 year olds paying 60% more for cover and those over 85 years old paying 169% more for cover.[61] Firms make assumptions that older people are at greater risk of health emergencies than younger people. However,

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[60] Webb, Claire. (2022) 'Older travellers face less choice and higher prices for holiday essentials', *Which?*, 18 November 2022. Available at: https://www.which.co.uk/news/article/older-travellers-face-higher-prices-less-choice-aG2Tm0f2xAJr (Accessed 23 February 2023)
[61] Webb, Claire. (2022) 'Older travellers face less choice and higher prices for holiday essentials', *Which?*, 18 November 2022. Available at: https://www.which.co.uk/news/article/older-travellers-face-higher-prices-less-choice-aG2Tm0f2xAJr (Accessed 23 February 2023)

data is often sparse and unreliable for older age groups, particularly those age 90 and above.[62]

The loyalty premium is penalising older people

Older customers also face loyalty premiums as a result of algorithms determining who is most likely to stay with an insurance provider. An investigation by the FCA determined that some home and motor insurance firms in the UK use algorithms to identify customers most likely to review with them. These customers are then faced with increased prices at renewal, to the extent of 100% more increase in price over time. This practice disproportionally affects older consumers and cumulatively can lead to large increases in price over time.[63]

Conclusion

Age is considered an important risk factor in insurance, so it seems logical to find evidence of different outcomes in the insurance sector based on age. As a result, using personal data of age in these instances is biased because insurers judge risk by age, but the bias is not necessarily unfair or unreasonable. This is where complex debates outlined in Chapter 2 surface about what, as a society, legislators or regulators deem acceptable judgements to make about people based on age.

3.4 Sex/gender

The story: there is limited evidence that suggests consumers are experiencing different outcomes or bias based on gender due to the way personal data and algorithms are used, but proxy data may lead to this

Gender is undoubtably an important protected characteristic when it comes to financial services, with women being more likely to use higher cost credit (especially applying for catalogue or shopping credit) compared to men, and less likely to have access to a pension.[64] That said, there is less evidence that the use of personal data and algorithms is leading to unfair or negative outcomes for women or men in financial services.

However, this lack of evidence does not mean it isn't happening. For instance, lone parent households are more likely to be in poverty, and are most likely to be headed up by women. Single parent families are also less likely to have access to motor, building and contents insurance and more likely to be accessing high-cost credit as opposed to mainstream lending.[65] It is important to recognise the impact

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[62] Australian Human Rights Commission (2022). 'Artificial intelligence and discrimination in insurance pricing and underwriting', *Australian Human Rights Commission*

[63] Financial Conduct Authority (2020), 'General insurance pricing practices market study: Final Report'

[64] Financial Conduct Authority (2021), 'Financial Lives 2020 Survey: the impact of Coronavirus', *Financial Conduct Authority*

[65] Davies, Sara., and Collings, David. (2021) 'The Inequality of Poverty: Exploring the link between the poverty premium and protected characteristics', *Personal Finance Research Centre*

this can have on credit scores, and therefore, the feedback loop created by algorithms, machine learning and their inputs. The lack of clear evidence of this may in and of itself be something to be interested in, and the Panel may want to observe how this plays out in the future. So, this may be an area for future study or interest for those interested in the impact of personal data and algorithmic decision-making in financial services.

Indirect discrimination: men are paying more for insurance

The evidence in this review has found that when it comes to gender-based bias, there may be indirect discrimination at play, with men paying more for certain products than women as a result of machine learning systems which have identified certain 'risk' criteria as most likely to be associated with men.

For example, life insurance models have historically debated which occupation categories to include. Life insurance modelling has shown that <u>not</u> including occupation categories results in higher premiums for lower-risk males, than if occupation is included, as men tend to perform a higher proportion of riskier occupations than females, such as working in blue-collar occupations.[66] Additionally, including occupation data impacts the measured effect of a customer's gender on the expected mortality risks in life insurance and the resulting price proposed by the model.

Sometimes, the higher prices make sense: particularly when it comes to car choice

However, taking gender into account in determining risk and therefore the price of a product or service is not always considered to be unreasonable, as referenced in chapter 2. For example, when determining car insurance, a vehicle's engine size is frequently found to be a good predictor of car insurance claim costs. It is also generally accepted that engine size is correlated with gender, with male drivers tending to drive cars with bigger engines. However, use of engine size has been determined to be a reasonable consideration in risk based on two grounds: bigger engine size has a direct relationship to risk (i.e. bigger engines tend to cost more to repair and more powerful cars can cause more damage to the things they hit) and the engine size is not innate to the protected group itself (i.e. men are free to purchase a car with a small engine).[67] As a result, while the use of engine size in underwriting algorithms is likely to result in higher premiums, which are likely to be borne by men, this is felt to be a fair outcome.

Conclusion

There is not so much 'smoke' relating to gender-based bias compared to ethnicity and disability in the evidence reviewed. But, the lack of evidence may be a source

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[66] Australian Human Rights Commission (2022). 'Artificial intelligence and discrimination in insurance pricing and underwriting', *Australian Human Rights Commission*

[67] Anti-Discrimination Working Group of the Actuaries Institute. (2020) 'The Australian Anti-Discrimination Acts: Information and Practical Suggestions for Actuaries', *Anti-Discrimination Working Group of the Actuaries Institute*

of interest given we know that women are likely to be accessing different products than men (e.g. high cost credit), which could impact credit scores. We know this information is used extensively in algorithmic decision-making, so gender as a characteristic cannot be ignored in studies of potential bias.[68]

The focus and weight placed on credit scores may form part of the debate around what personal data is considered fair, reasonable and justifiable when taking decisions about consumers' risk profiles.

3.5 Intersectionality and other protected characteristics

Intersectionality matters

This review has explored in depth the protected characteristics of ethnicity, disability, gender and age. While we have focused on each in turn for ease of navigation and completeness, we also recognise that bias and unfair treatment is likely to impact people differently, with intersectionality playing an important role in the way and extent bias is experienced.[69]

Characteristics not explored in this research matter too, and may be of future interest or consideration

While the evidence review focuses on four key characteristics, it recognises that other protected characteristics in the Equalities Act, such as sexual orientation and religious belief, may have a significant and detrimental impact on consumer outcomes. As one expert pointed out, historically LGBTQ+ struggled to access health insurance at fair rates after the HIV epidemic. This example shows how bias can change over time, and financial firms must be aware of new and arising barriers to fair and unbiased access.

Religion could also be an area for future consideration. The USA Consumer Financial Protection Bureau has raised concerns about financial service firms asking questions about an applicant's religion when accessing loans.[70] How this personal data is being used is questioned and points to the potential for discrimination along the lines of religious belief.

It is also well known, for example, that certain religions may require different practices from financial services, with a range of Shari'ah compliant service

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[68] Batler, Laura., and Nelson, Scott. (2021) 'How Costly is Noise? Data and Disparities in Consumer Credit', ArXiv abs/2105.07554

[69] Davies, Sara., and Collings, David. (2021) 'The Inequality of Poverty: Exploring the link between the poverty premium and protected characteristics', *Personal Finance Research Centre*

[70] Salas, L. (2022) 'It's illegal to penalize borrowers for being religious', *Consumer Financial Protection Bureau,* 14 January 2022. Available at: https://www.consumerfinance.gov/about-us/blog/its-illegal-penalize-borrowers-being-religious/ (Accessed 2 March 2023)

providers in the UK offering alternatives to traditional products such as mortgages and current accounts that take into account requirements of Islamic banking.

Circumstances and characteristics can change over time, so can harms experienced

Finally, we also recognise that personal circumstances are not static, and characteristics such as health, disability, age, and gender identity can change over time. So, the potential bias and harms outlined above can impact people differently at various stages of their lives.

Despite this complexity, we feel the evidence points to some people, especially those of colour, experiencing biased outcomes that could be harmful due to the use of personal data and algorithms, albeit this is often correlated with other proxy data such as postcode data.

empirical evidence is found or not found, the Panel are justified in its concern and interest in the subject given the level of concern raised.[71]

As we outlined in Chapter 3, there also does appear to be evidence of some discriminatory outcomes occurring in relation to some protected characteristics, even if some of the evidence bases can be thin or contested.

Given this is such as important issue, there is a pressing need for not only debate, but to agree shared principles and standards on:

- The extent to which, or situations where, the benefits of using personal data and algorithms in financial firms decision-making outweighs the harms or risk of bias;
- Clear lines of 'fairness' and what is 'reasonable' when it comes to risk-related decision-making, when it impacts people with protected characteristics;
- Evidencing that bias or harm is **not** occurring, and the nature of the evidence required to do so.

Industry, academics, and consumer groups are becoming ever more conscious of potential harms experienced by people due to algorithmic decisions. But they also agree real change needs to be driven forward by legislation and regulation, for it to have impact going forward. Indeed, this is likely to continue to require urgent attention as datasets and the use of AI grow, and with it there is increased disconnection between the original design and data used to determine the patterns and outcomes being detected. At the time of finalising the report, this issue was being widely debated, with a letter signed by many leading experts calling on a pause in developing ever more powerful AI tools until the implications are known (though this was critiqued for also lacking acknowledgement of regulatory issues).[72]

In this context, the current moment is an opportunity for the Panel to get ahead in terms of understanding the problem, as well as advocating for solutions. As experts acknowledged, it is a gnarly and complex issue, but one that requires bravery, leadership and a joined-up approach to address:

> *"It's not just a regulatory issue though, is it? It's a social and political issue, how do we use data in financial services? There needs to be some political interest in it too." - Expert*

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[71] European Union Agency for Fundamental Rights (2018) '#BigData: Discrimination in data-supported decision-making', European Union Agency for Fundamental Rights
[72] Narayan, Jyoti., Hu, Krystal., Coulter, Martin., and Mukherjee, Supantha. (2023) 'Elon Musk and others urge AI pause, citing 'risks to society'', *Reuters*, 29 March 2023. Available at: https://www.reuters.com/technology/musk-experts-urge-pause-training-ai-systems-that-can-outperform-gpt-4-2023-03-29/ (Accessed 31 March 2023)

4.2 A global issue: How other jurisdictions are grappling with this

This evidence review considers the international picture throughout, and evidence has been assessed in the UK, USA, Australia, Canada, and Europe as well as experts being interviewed from each of these jurisdictions.

Experts from across the globe state that despite best efforts they are all grappling with the difficult discussion of how personal data and AI is used in financial services and the impact this may have on consumers, as well as there being a lack of concrete evidence to categorically evidence the extent to which and mechanism that lead to it occurring.

Different jurisdictions may be at different points in the debate or journey of trying to fully understand, evidence and regulate in response to the issue of how personal data is being used by financial services and the outcomes this may lead to, but given the complexity of the issue a solution to this has remained elusive and the measures being implemented are embryonic.

Given the global nature of the banking industry, rather than look to any one jurisdiction as a model for the future, good practice from across the globe could be combined to shape a more unified set of principles and understanding that involves informed debate, knowledge sharing and discussion.

Here we have outlined our learnings from the evidence review and expert interviews in each jurisdiction, but we acknowledge this has could be the tip of the iceberg, and a more sustained approach would be required to fully 'join up' learning on this complex topic in the future.

Informed debate in Australia

Evidence from the Australian Competition and Consumer Commission says current legislation in Australia is insufficient to protect consumers from harm as part of its review into digital platforms.[73] However, one expert suggested the fact this inquiry even exists is evidence that Australian authorities are having progressive conversations about the impact of increased use of personal data and algorithms in financial services.

Additionally, the Australian Human Rights commission has published work which deep dives into efficacy of personal data in insurance in partnership with the industry body for actuaries, highlighting the prevalence of the discussion explored in this paper in Australia.[74] The paper explores the need for firms to take greater

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[73] Consumer Policy Research Centre (2022) 'Submission to the ACCC on the Digital Platform Services Inquiry on updating consumer law for digital platform services', *Consumer Policy Research Centre*
[74] Australian Human Rights Commission (2020) 'Using artificial intelligence to make decisions: Addressing the problem of algorithmic bias', *Australian Human Rights Commission*

responsibility over the AI systems they use. This includes a focus on increased transparency between consumers and firms, which would allow consumers to seek explanation for exactly how their data is being used and seek redress if they dispute the use. It also calls for firms to be transparent with consumers about *when* personal data and algorithms are being used to make decisions about them. This will require firms to be better informed and aware of the detailed workings of the programming that decision-making tools they have bought or designed in house have, and the data used by algorithms within these models. This may currently be challenging. This important point – the need for firms to have a clearer grip on the programming of algorithms they use - has also been raised by leading thinkers in the UK space, including the Ada Lovelace foundation.[75]

One expert suggested that Australia's 'starting point' for the subject is different to that of the UK, because Australia has greater regulation around insurance to promote more pooled risk in health insurance, meaning appetite for and acceptance of regulation on big firms is likely be different to that in the UK.[76]

> *"The FCA say they aren't a pricing Regulator, which is a different mindset to Australia. We're used to having insurance price regulation, which the UK doesn't have. Sometimes we have very strict price regulation. There are a whole bunch of things very well established in Australia, so conversations like this have been had for decades. It's acceptable for people to have an opinion on this here." - Expert*

Increased regulation in Europe

Recent actions by the European Commission demonstrate an increased understanding of the large-scale impact AI and algorithmic decision-making can have on consumers' lives. In 2017 the European Union Agency for Fundamental Rights called for Member States to identify and take measures to minimise discrimination based on algorithmic decision-making.[77]

In terms of broader regulatory protection, members of the European Union are bound by GDPR, which embeds principles of non-discrimination based on protected characteristics,[78] and the 2022 Digital Markets Act which aims to ensure fair and open digital markets.

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[75] Ada Lovelace Institute, AI Now Institute, Open Government Partnerships (2021) 'Algorithmic accountability for the public sector', *Ada Lovelace Institution.* Available at: https://www.adalovelaceinstitute.org/report/algorithmic-accountability-public-sector/ (Accessed 7 March 2023)
[76] Keegan, C. (2020) 'The introduction of lifetime community rating in the Irish private health insurance market: Effects on coverage and plan choice', *Soc Sci Med* 255(1)
[77] European Union Agency for Fundamental Rights (2018) '#BigData: Discrimination in data-supported decision-making', European Union Agency for Fundamental Rights
[78] European Union Agency for Fundamental Rights (2018) '#BigData: Discrimination in data-supported decision-making', *European Union Agency for Fundamental Rights*

In 2021 the European Commission explicitly addressed the need to regulate AI, publishing a proposal for new legislation to cover the use of AI, which has core objectives of ensuring legal, safe and trustworthy use of AI.[79] It is the first regulator in the world to propose specific regulation to address the challenges of AI. The AI Act has proposed requiring companies using AI to have specialised attention to the systems and how they work - which speaks to calls by experts and evidence for greater industry accountability about how systems are used.[80]

"There needs to be people's role whose only job it is to do Governance of AI in the organisation and they should be asking consistently, how are these systems working? And whom are they working for?" - Expert

The Act, should it be ratified, will be ground-breaking in terms of providing a clear set of principles and legislation to address the concerns raised relating to the use of personal data and algorithms in financial firms' decision-making. However, following the UK's exit from the European Union, the AI Act will not apply in this jurisdiction and indeed questions remain about how core aspects of legislation relating to consumer protection and personal data– such as GDPR – will evolve in the UK in the future.

On the agenda in the US and Canada – but challenges remain

The USA is considering the impact of algorithmic decision-making at the Federal level, with its BluePrint for an AI Bill of Rights being released in 2022. One of the five key principles of this work is to protect against algorithmic discrimination, not only in financial services but more broadly.[81][82]

At the same time, the USA faces challenges regulating around personal data in financial services because regulation in relation to financial services, including insurance, is mandated and developed at the state level, rather than in Federal

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[79] European Commission (2021) 'Coordinated Plan on Artificial Intelligence 2021 Review', *European Commission*

[80] Engler, A. (2022) 'The EU Act will have global impact but a limited Brussels effect' *Brookings Institute,* 8 June 2022. Available at: https://www.brookings.edu/research/the-eu-ai-act-will-have-global-impact-but-a-limited-brussels-effect/ (Accessed 14 March 2022)

[81] Lee, Nicol Turner., and Malmud, Jack. (2022) 'Opportunities and blind spots in the White House's blueprint for an AI Bill of Rights', *Brookings Institute,* 19 December 2022. Available at: https://www.brookings.edu/blog/techtank/2022/12/19/opportunities-and-blind-spots-in-the-white-houses-blueprint-for-an-ai-bill-of-rights/ (Accessed 14 March 2023)

[82] Engler, A. (2022) 'The AI Bill of Rights makes uneven progress on algorithmic protections', *Brookings Institute,* 21 November 2022. Available at: https://www.brookings.edu/2022/11/21/the-ai-bill-of-rights-makes-uneven-progress-on-algorithmic-protections/ (Accessed 14 March 2022)

Government.[83] As a result, attempts to respond to challenges of bias and discrimination in financial services can be piecemeal and vary by state.

> *"The problem is, take insurance, we have fifty different states and then we have different regulatory regimes and rules for different insurance categories, life, health, motor. So, it makes all of this very difficult, and there isn't really a comparative FCA here." - Expert*

Canada also faces challenges in regulating and legislating around how personal data and algorithms are being used. The nation was one of the first to develop an AI strategy, showing understanding about the impact of new technologies on decision-making. However, experts say it is further behind in terms of data legislation than the UK, meaning the nation does not have the same clear rules about how personal data is allowed to be collected, stored and used.

> *"Canada was supposedly the first to get AI strategy, however this was more about leadership in terms of AI rather than bias detection and fairness and human rights. The two need to be more joined up." - Experts*

4.3 Regulatory leadership is required

Given the level of concerns raised by consumer groups, experts, and evidence, the FCA clearly have a strong role to play in understanding, debating and addressing the issue of bias being driven by the use of personal data and algorithmic decision-making. Citizens Advice, for example, have called on the FCA to set out their expectations to industry for how they should and shouldn't be using algorithms and making decisions using them.[84]

Experts also believe the FCA have the necessary data and resource to further investigate if bias is occurring, through exercises similar to that of the Citizens Advice research.

Key areas of legislation that are being developed internationally include AI Governance in organisations, accountability and explainability for how data is being used. The development and implementation of equivalent legislation in the UK context may be key areas for interest for the FCA going forward.

Whilst the Consumer Duty is an important part of the conversation in securing 'good outcomes' for consumers, experts want to see the FCA directly address

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[83] Thouvenin, Florent., Suter, Fabienne., George, Damian., and Weber, Rolf H. (2019), 'Big Data in the Insurance Industry: Leeway and Limits for Individualising Insurance Contracts', *Journal of Intellectual Property, Information Technology and Electronic Commerce Law* 10(2)

[84] Cook, Tilly., Greenall, Aiden., and Sheehy, Emer. (2022) 'Discriminatory Pricing: Exploring the 'ethnic penalty' in the insurance market', *Citizens Advice*

algorithmic decision-making as part of this, as opposed to make assumptions as to how the implementation of the Consumer Duty would cover the use of personal data and algorithmic decision-making.

Beyond specific legislation, debates around algorithmic decision-making and the use of personal data is societal, and may need to include many more voices than the 'usual suspects' i.e. regulators only.

> *"It's within the FCAs gift to declare this a problem but it would be a pretty unpopular thing to do. It's also about whether that's [regulation is] the right place to start." - Expert*

Experts we heard from also considered the need to have global discussion about regulating and setting parameters for personal data use and algorithmic decision-making in financial services because of the global nature of tech development and financial services. Again, the FCA has a clear role to play and needs to be 'at the table' in this conversation.

> *"AI doesn't know any national boundaries, whatever any country does is going to help in the areas of bias detection and fairness, because it's a global market. Working together and building on each other's requirements would be helpful." - Expert*

4.4 What does this mean for the Panel: Final reflections and considerations

In summary, this leads to some key implications for the Panel, both in terms of how they may advise or challenge the FCA when advocating for consumers and the specific role the Panel may have when engaging with this issue themselves:

Advocating for the regulator to take action, ultimately leading to greater consumer protection:

1. **There is a need for conversation and public debate on the topic of bias and AI in financial services, and time is of the essence.** The wider discussion around biased outcomes in AI is highly salient in public debate and there is scope for this to be tailored to outcomes in financial services specifically. We know AI is always developing, its capability changing, and computer processing meaning more and more personal data can be used to inform decisions. This debate needs urgent attention before technologies advance further, becoming even more opaque.

2. **Debate should focus on and culminate in a set of agreed principles, around *what* personal data is reasonable to use to determine access, price and outcomes in financial services when risk-based decisions are made.** This debate has to be grounded in an

understanding of the financial industry and markets to ensure these continue to operate effectively. But it is also a moral and societal debate about fairness and equity.

3. **There is a need for more transparency about how data is being used to evidence areas of concern. The FCA have a strong role to play in operationalising this.** Experts note the FCA have the expert personnel, data sources and resource to investigate concerns and respond to them. If this isn't the role of the FCA to further explore where there may be evidence of bias or how it could be found, then who will take these issues forward in the UK?

4. **There is a need for firms to be more proactive in evidencing no bias is occurring. Regulation would be the most effective way to drive change in this area and provide clear lines of accountability for firms in terms of what they need to do and evidence.** With the incoming Consumer Duty, there could be opportunity for the Panel and ultimately, the FCA to reflect on what is required from firms in terms of AI Governance, with an onus on proving any unfair bias is not coming as a result of their infrastructure. As part of this, the Panel may consider whether to recommend the regulator requires firms to demonstrate greater transparency about the personal data used by their algorithms, meaning consumers will know what information is being used to make decisions about them. This could possibly include publishing the data points used in algorithmic decision-making (although not how it is used if this challenges competition rules) and drawing on how such actions are being legislated for in other jurisdictions.

The Panel themselves also have a role to play in continuing to advocate for consumers and the wider sector when it comes to these issues:

1. **Advocating for the FCA to maintain a specific focus on how the use of personal data and algorithms in decision-making impacts consumers, and not to assume that potential harms will be addressed through implementation of the Consumer Duty.** As has been outlined above, regulation has a vital role to play in providing leadership on this issue, and there is a need to continue to advocate for this to ensure greater protection for consumers for any potential harm that may ensue from how their personal data is used.

2. **Ensure consumers remain central to debates on fairness.** Debates around what is fair and proportionate in terms of use of personal data, algorithms and risk in financial products should take

care to balance the views of different stakeholders – bearing in mind that consumer stakeholders have limited capacity and resources compared to industry. It is important that consumer interests are adequately represented in debates around *fair* data use vs risk. Here, the Panel could play an important role in steering conversations about consumer attitudes, protection, and fairness.

3. **Driving and contributing to joined-up discussions across the consumer protection sector.** With key pieces like the Citizens Advice work at the heart of the debate, there is opportunity for the Panel to galvanise these conversations and join discussion in existing groups to understand more about the impact of AI in financial decisions, and regulation needed to make a change both in the UK and internationally. As noted above, action on this is pressing as technologies quickly advance and datasets continue to grow and develop.

4. **Ensuring a focus on those consumer groups who may be most at risk of harm from the use of personal data and algorithmic decision-making:** Ethnicity and disability are important protected characteristics where consumers are experiencing harm and biased outcomes in the UK context. How and who is best placed to address this and negate the harm that may be being experienced among these groups should be a pressing next step to consider for the Panel. The broader systemic changes suggested will take time to implement – meanwhile ethnic minority consumers or people with disabilities will continue to experience bias.

Appendix 1: Table overview of hypothesis and protected characteristics

To summarise the evidence, we have created an initial overview table coded as follows:

Code	Interpretation
Colour: red	• There is evidence of biased and negative outcomes under the hypothesis and protected characteristics. • Evidence is both anecdotal and empirical. • Bias is said to be a result of the use of personal data and / or algorithmic decision-making.
Colour: yellow	• There is evidence of biased outcomes under the hypothesis, which lead to negative outcomes and protected characteristics. • Evidence is both anecdotal and empirical. • Bias is not necessarily because of the use of personal data and / or algorithmic decision-making.
Colour: green	• Bias that leads to negative outcomes is not found in the evidence review.
Written code: concern level	• Explains the level of concern as a result of the finding for the hypothesis and protected characteristic.
Written code: evidence level	• Explains whether bias due to algorithmic decision-making exists (evidenced), is indicated (limited evidence), or does not exist (no evidence).

Following the overview grid, there is a section on each of these protected characteristics discussing the evidence of potentially biased, unfair or discriminatory outcomes.

		Protected Characteristic			
		Gender	**Ethnicity**	**Age**	**Disability**
Hypotheses	**1. Accessing products**	**Medium concern, limited evidence** The review notes women do have different outcomes in terms of the products they hold e.g. more likely to access high cost credit. This suggests gender stay an area of interest given this personal data is likely to be used to make decisions in the future.	**High concern, evidenced** There is evidence of Black consumers being more likely to be denied **mortgage products** as a result of algorithmic decision-making.	**Medium concern, limited evidence** Age limits and cut offs for **insurance products**, including motor and travel insurance, discriminate against older people and prevent access to certain products. Insurers are transparent about using age as a risk factor, and this is legal.	**High concern, evidenced** Evidence points to disabled people being more likely to be denied **insurance products** due to their condition. Access to **bank accounts** are also lower among disabled than non-disabled people.
	2. Bias in prices	**Medium concern, limited evidence** Indirect discrimination towards men occurs in **life and car insurance**, in that data relating to occupation and car engine size respectively is used to determine price, and riskier occupations and larger engine sizes are associated with men.	**High concern, evidenced** Ethnic minorities are likely to receive higher interest rates on **mortgages**, with researchers speculating this is due to algorithmic lending discriminating based on intragroup variation, such as neighbourhood or shopping behaviour (personal data). AI that uses postcodes (personal data) to determine **car insurance** premiums	**High concern, evidenced** The use of algorithms by insurance companies to identify customers who are more likely to renew an **insurance** policy discriminates against older customers who are more likely to pay a loyalty premium as a result. Higher costs for travel insurance for older people are also often	**High concern, evidenced** Disabled people are more likely to be charged higher **insurance** premiums due to their condition. Personal data is being used to make inferences about applicants but the specific data and impact it has is opaque, e.g. seeking treatment for a condition does not bring down the prices of insurance premiums.

		also seen to discriminate against ethnic minorities.	based on thin and unreliable data sets.	There is increased concern about the role of mental health in accessing and paying for **insurance**, with personal data and algorithm use resulting in higher premiums, despite parity in claims.
3. **Bias in other terms e.g. level of cover**	**Low concern, no evidence** The evidence reviewed does not point to gender being a discriminatory characteristic in algorithmic decision-making and personal data use of fair treatment for products.	**Medium concern, limited evidence** Evidence shows that Black consumers receive smaller **loans** relevant to income in areas where ethnic minorities are more likely to live, using personal data, specifically postcodes to make the call. There are however fewer evidence points compared to access and price, keeping this as an area to watch.	**Medium concern, limited evidence** Evidence points to older people who have certain **insurance** products as part of their bank account, having the benefits or levels of cover of these products stripped back as they get older, while monthly fees for the account remain the same.	**High concern, evidenced** Disabled people are less likely to be able to find **insurance** products that provide appropriate levels of cover and find assumptions are often made about them as a result of disclosing their condition. Those with mental health conditions similarly do not feel insurance companies treat them fairly in terms of access to product, price or level of cover.
4. **More negative outcomes**	**Low concern, no evidence** The evidence reviewed does not point to gender being a discriminatory characteristic in	**High concern, evidenced** Use of AI has resulted in Black customers having more difficulty receiving **insurance** claims pay-outs and being given worse	**Low concern, no evidence** The evidence reviewed does not point to age being a discriminatory characteristic in algorithmic decision-	**Low concern, no evidence** There is evidence to suggest disabled people find it harder to make claims and that the process is

		algorithmic decision-making of fair outcomes for products.	quality emergency housing compared to White counterparts. One landmark case points to this, and is facilitating conversation, focus and concern about treatment of ethnic minority consumers from the use of personal data and algorithmic decision-making.	making of fair outcomes for products.	bureaucratic and not adapted to their needs. But, there is no evidence this is a result of algorithms or personal data use.

Appendix 2: Chat GPT

We asked AI Chatbot, Chat GPT whether AI and algorithmic decision-making leads to bias. Answers are generated based on the internet's history up until 2021. The below is a telling picture of how accepted it is in information across the internet that AI and algorithmic decision making does lead to bias.

PH Does AI and algorithmic decisions lead to bias?

Yes, AI and algorithmic decisions can lead to bias. Bias can arise in AI systems and algorithms when they are trained on biased data, use biased models or algorithms, or are designed or implemented in a way that perpetuates existing biases.

For example, if an AI system is trained on historical data that reflects discriminatory practices, it may learn and reinforce those biases in its decision-making. Similarly, if an algorithm is designed to optimize for certain outcomes, such as maximizing profit or reducing costs, it may lead to biased decisions that disproportionately affect certain groups.

Moreover, algorithms and AI systems are only as unbiased as their designers and data sources. If the designers themselves have biases or if the data sources are not diverse or representative, the resulting algorithm or AI system will likely reflect those biases.

It is important to recognize the potential for bias in AI and algorithmic decision-making and to work to mitigate those biases through techniques such as diverse training data, ongoing monitoring and testing, and transparency in the decision-making process.

Appendix 3: Case studies: see supporting document in PowerPoint

Appendix 4: Methodology in detail

Gathering and selecting high quality sources

Our approach to the evidence review combined desk research of relevant sources with qualitative expert interviews. Our desk research involved gathering quality sources before rigorously analysing them against the Panel's objectives.

We supplemented our literature review by simultaneously conducting interviews with experts in the field of data ethics, consumer protection and insurance from across the five markets the Panel is interested in, namely the UK, USA, Australia, Canada and Europe.

We conducted a comprehensive search of publicly available evidence, including some initial assessment of relevance and quality. We used a range of search engines including Google Scholar and direct searches of Government and regulator websites in each of the five territories. Our search terms included: personal data, artificial intelligence, big data, machine learning, algorithms, algorithmic decision-making, discrimination, bias, unfair outcome, financial service firms, insurance, credit, mortgage, consumers, vulnerable customers, protected characteristics, age, race, ethnicity, gender, disability, access, prices, level of cover, and claims handling.

We added to the source list on an iterative basis by cross-referencing with additional evidence in the bibliography of relevant sources and by asking interviewed experts for literature recommendations.

We organised the source list according to the source's country of origin, publication year (only including sources from 2017 onwards to ensure relevancy), source type and topic area i.e., whether it specifically related to one of the four tested hypotheses, provided broader context to the issue or examples of best practice.

This organisation allowed us to identify any evidence gaps in our source list early on. We then continued to source-build accordingly to ensure the literature covered each of the tested hypotheses and geographical scope requested by the Panel.

In total, we gathered 67 high-quality sources that focus on empirical evidence and are relevant to the research question, protected characteristics, financial products, geographical scope and date of the research. Our robust source list includes a mixture of empirical data, research papers, charity reports, thought leadership articles, proposal statements, committee meetings, evidence assessments and media articles.

After gathering 67 reliable sources, we selected the 47 most relevant sources to closely review.

We decided which sources to prioritise for review according to:

- **How empirical the evidence is**;
- **Its relevance to the research question** about whether the use of personal data and algorithms by financial service firms is leading to negative outcomes for consumers with protected characteristics;
- **Its focus on the protected characteristics** considered in the research scope i.e., age, gender, ethnicity and disability;
- **Its focus on the financial products** considered in the research scope i.e., insurance, credit and mortgages;
- **Its focus on best practice and regulation;**
- **Geographic relevance** to the UK, USA, Australia, Canada and Europe;
- **Date of the research**, prioritising the most recent sources to ensure relevancy.

Analysing sources to write the evidence review

We then applied a rigorous protocol to analysing these sources using a structured evidence grid in Excel. We deployed our social research foundations to ensure the analysis is iterative and complete in response to the complex subject area.

The evidence grid was organised by theme so that each key finding from a source was categorised according to a specific protected characteristic, financial product, tested hypothesis, and/or any other topic area. This allowed us to easily filter for all the relevant information for a specific hypothesis, protected characteristic, financial product or any other topic area across all the sources. This enabled us to systematically identify commonalities, differences and gaps across the dataset, including the prevalence of any key patterns or differences by product, protected characteristic and hypothesis.

The grid was populated throughout the research process by all members of the team in a live document. This ensured the team had oversight of the full set of sources, enabling us to draw our findings and conclusions from a complete dataset instead of team members only engaging with a limited set of sources individually assigned to them.

The grid was regularly reviewed by the team as the project progressed and formed the basis of brainstorming discussions about the findings. This regular review allowed us to critically analyse the evidence in the literature, identify any gaps and search for areas of 'best practice' as the project evolved.

Selecting experts relevant to the discussion

Whilst reviewing the literature, we conducted a total of eight 30-minute interviews with key experts in the field. Of these, four experts were from the UK and one expert was from the EU, USA, Australia and Canada respectively.

We built out the sample list provided by the Panel by identifying relevant organisations working on these topics across the five markets and asking them for recommendations of who best to approach for this research. Once we started conducting interviews with experts themselves, we snowballed recruitment based on their recommendations.

We approached a combination of academic and research experts who could point us towards the most relevant evidence about financial service firms' use of data as well as industry experts who can discuss key themes or debates that are ongoing in relation to the ethical implications of financial service firms' data use.

During interviews, we used a short discussion guide covering key themes relevant to the research question. We used the expert interviews to identify case studies of bias occurring as a result of financial service firms' data use, and to explore any examples of good practice and regulation that prevented this from occurring. Since we were conducting interviews concurrently with the evidence review, we were able to explore and stress test some of the emerging hypotheses or debates that were being evidenced in the research during the interviews. We also used the expert interviews to snowball sources that covered the gaps we identified during our literature review.

The experts immersed in the subject had a clear sense of direction for the most important literature or any new and developing thinking in our areas of interest.

We added new evidence, insights and additional sources that emerged out of each interview to the evidence grid which ensured a comprehensive data set.

Experts we interviewed are found below. We have anonymised quotes throughout as per our permissions with them:

Name	Role and Organisation	Reason for engagement
Duncan Minty	Independent ethics advisor, UK	Recommended by the Panel
James Daley	Managing Director, Fairer Finance, UK	Recommended by the Panel
Susan Scott-Parker	Founder, business disability international	Recommended by the Institute for Ethics in Artificial Intelligence at The Technical University of Munich, Germany

Expert in how AI affects people with disabilities |
| Robbie Stamp | CEO, Bioss International | Recommended by Susan Scott-Parker, sits on |

		the British Standard Institute's National Standing Committee on Artificial Intelligence.
Chris Dolman	Executive Manager, Data and Algorithmic Ethics, Insurance Australia Group, Australia	Wrote guidance resource for the Australian Human Rights Commission on artificial intelligence and discrimination in insurance pricing and underwriting
Rick Swedloff	Professor of Law, Rutgers Law School, USA	Author of a research paper on how insurance regulation should adapt to changes brought about by use of artificial intelligence and big data
Jutta Treviranus	Director of the Inclusive Design Research Centre, Ontario College of Art and Design, Canada	Involved in writing a draft artificial intelligence regulatory standard for the Accessible Canada Act
Peter Norwood	Senior Research and Advocacy Officer, Finance Watch, EU	Researcher on insurance and financial inclusion with extensive experience working for regulators, institutions and associations in the EU financial services sector

Appendix 4: Source list

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