MILLIMAN REPORT

Fairness in UK health insurance

Developing a framework and best practices in health insurance

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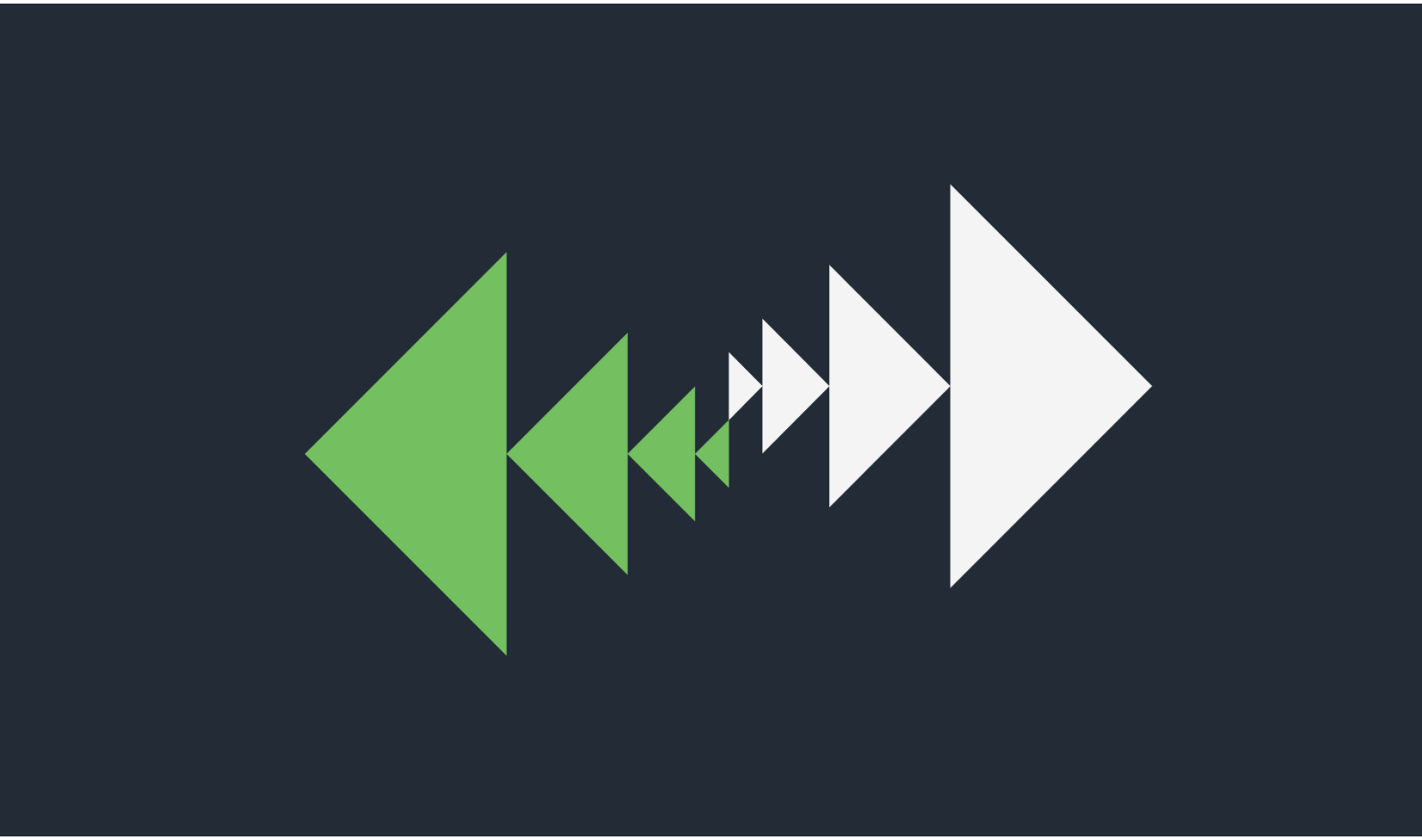

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Executive summary

While most people have their own definition of "fairness", working out what is fair in health insurance is far from trivial. However, "fairness" is increasingly topical for UK health insurers with a confluence of regulatory expectations, consumer lobby groups, customer pressures, the rising use of machine learning and generative artificial intelligence (AI) held against a backdrop of politicised discourse and social media polemics, where views on what is "right", or "fair" increasingly diverge.

This paper explores what "fairness" means in the UK health insurance market, practical steps that insurers can take to articulate how they think about "fairness", a framework of principles and practices (including applicable laws and regulations) around fair customer treatment, fair value and the duty of care for all customers within the private health and/or disability insurance segments. It is thus relevant to all senior UK health insurance professionals and quickly moves from the theoretical considerations in defining "fairness" to practical considerations of developing frameworks and then integrating and incorporating them into business practices.

Our starting point is that "fairness" in health insurance involves equitable access to healthcare services, non-discriminatory practices and transparent communication between insurers and their customers. But brief experience of the current divergent discourse highlights that there is a range of views on what "equitable" and "non-discriminatory" mean in practice.

We recommend that insurers take the four-step approach to "fairness" shown in Figure 1.

FIGURE 1: FOUR-STEP APPROACH TO FAIRNESS

DEFINE	INTEGRATE	ASSURE	SCAN
Develop a framework of what "fairness" means for you	Integrate into business strategies, operations and practices	Embed monitoring and assurance processes to evaluate outcomes	Horizon scan for continuous improvements and remediations

The core elements of these steps (detailed in Parts 1 to 4 of this paper), which can be fitted into a firm's overall governance and operations, are summarised below.

PART 1: DEVELOP A FRAMEWORK TO DEFINE FAIRNESS

There is no unique definition of "what's fair." Whilst this could be casual assessment by each individual, a robust, consistent and transparent approach to fairness will require a set of clearly articulated principles that can be put into practice. At a minimum, the principles need to comply with relevant laws and regulations, which include:

- The Consumer Duty of the UK Financial Conduct Authority (FCA): With a focus on outcomes, offering fair value and ongoing monitoring and remediation if required.
- Protected characteristics and vulnerable customers.
- Privacy, data fairness and the use of AI.

Beyond the regulatory boundary, "fairness" can be seen as an opportunity to generate value to both the enterprise and its wider community. Fairness frameworks can be aligned with corporate and brand values as part of the broader enterprise strategic and risk management framework. A robust value-based framework would consider key fairness principles such as equality, need, deserts, recognition, participation and distribution[1] alongside the direct regulatory requirements. Mutuals, and leading brands, may want to provide not only transparency in the principles but consider the broader governance of who decides "what's fair" and the potential for policyholder participation.

1. Perspectives include John Rawls's A Theory of Justice (1971), Nancy Fraser's Scales of Justice (2009) and David Miller's Principles of Social Justice (2017).

PART 2: INTEGRATE INTO STRATEGIES AND OPERATIONS

The next stage is to integrate the framework into business practices and operations by translating the fairness principles into practical policies and guidelines, using appropriate tools and methodologies, in the areas of:

- **Pricing and underwriting:** Including medical underwriting approaches, with a focus on transparency and consistency of decision-making, appropriate risk and rating factors and clear communication to customers. "Fairness" extends to renewal terms, exclusions and a reasonable use of caps and limits within benefit coverages in the product design.
- **AI usage:** Including approaches to pre-screening and calibrations so that the data and models used are appropriate, with robust model risk management and output testing. Insurers also need to be able to address the emerging issues of data privacy, explainability and sufficient human oversight when using AI technologies.
- **Access and quality of care:** To act on structural healthcare biases, for example as experienced in gender and race.[2,3,4]
- **Sustainable business model:** By adopting innovative strategies such as vintaging and experience sharing, health insurers can enhance their risk management, improve pricing accuracy and deliver better value to customers. These approaches not only contribute to the long-term viability of health insurance companies but also support the broader goal of a more efficient and effective healthcare system.

PART 3: EMBED ASSURANCE PROCESS

The FCA's Consumer Duty focuses on "delivering good outcomes," and any fairness framework can only be considered "fair" to the degree it delivers on its intended objectives. A robust assurance process includes:

- **Algorithmic testing:** A proactive approach to investigating and remediating biases, with greater focus on indirect bias and recognising "fairness through unawareness"—simply removing a specific characteristic from data used in the pricing algorithm is not robust in avoiding bias.[5]
- **Customer claim journey**: Health insurance claim journeys can be closely intertwined with individual clinical and/or healthcare treatment pathways, and hence when customers are most vulnerable. Treating customers fairly with utmost duty of care should be factored into the "end-to-end" pathway or journey in line with the Consumer Duty principles.
- **Societal inclusion**: How an insurer's business brings value and contribution to the wider society is key to enhancing an understanding of how the fairness framework is implemented in the real world, which in turn should help insurers identify further commercial and business opportunities.

PART 4: HORIZON SCANNING TO REVIEW AND RENEW

Fairness practices and expectations can shift significantly in short timeframes; thus, frameworks need reviewing regularly. Horizon scanning helps challenge existing practices and identify emerging trends and developing expectations, e.g.:

- EU regulations and consumer pressure groups are often UK precursors: current campaigns to watch include the "Fair Insurance Pricing" campaign and "Right to Forget" (for cancer)
- Greater personalised medicine and healthcare are likely to mean that trust, privacy and fairness are increasingly necessary parts of ensuring good customer outcomes.

2. NHS (June 2021). Ethnic Health Inequalities and the NHS. Retrieved 3 February 2025 from https://www.nhsrho.org/wp-content/uploads/2023/05/Ethnic-Health-Inequalities-Kings-Fund-Report.pdf.

3. NHS. Ethnic Inequalities in Healthcare: A Rapid Evidence Review. Retrieved 3 February 2025 from https://nhsrho.org/research/ethnic-inequalities-in-healthcare-a-rapid-evidence-review-3/.

4. Beckley, I. et al. Podcast : The Bias Diagnosis. Retrieved 3 February 2025 from https://www.audible.co.uk/podcast/The-Bias-Diagnosis/B08W4YZT2S.

5. Teodorescu, M. Protected Attributes and "Fairness Through Unawareness." Retrieved 3 February 2025 from https://ocw.mit.edu/courses/res-ec-001-exploring-fairness-in-machine-learning-for-international-development-spring-2020/77bc776713bc03164a4a272b9fe65ca1_MITRES_EC001S19_video6.pdf.

CONCLUSION

Understanding "what's fair" and integrating it in business practices is not trivial. For those looking to have robust, consistent approaches, there is a need to develop an appropriate framework, integrate it into business practices, assure and monitor these integrations and then review and renew on a regular basis. Depending on where an insurer is on this journey, these key "next steps" are relevant:

- Developing a framework
- Integrating and implementing in practice
- Embedding assurance processes and reviewing algorithmic testing
- Horizon scanning, monitoring and evaluation

Finally, given the recent criticism of weaknesses in the FCA's protection of consumers[6], UK insurers may see future regulatory action as early as 2025.

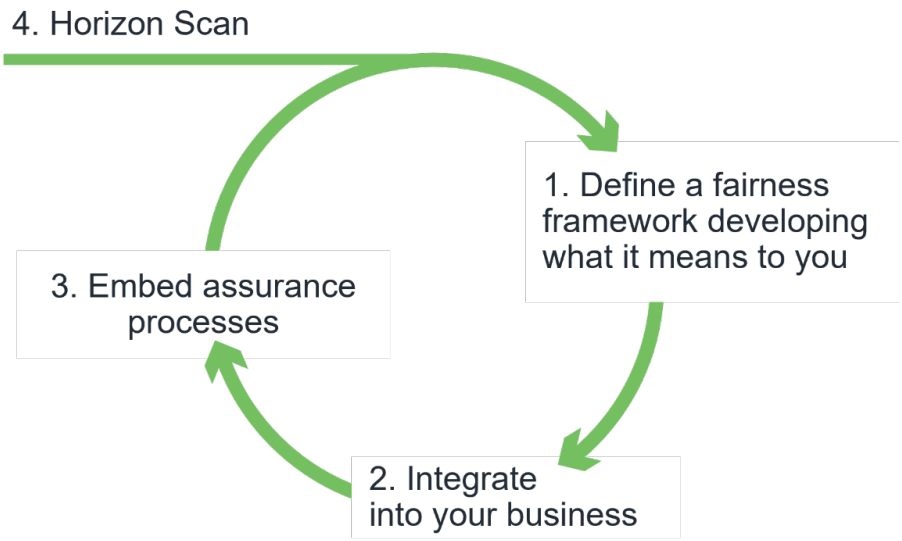
Overview of our paper

"Fairness" is increasingly topical for UK health insurers with a confluence of regulatory expectations, customer pressures and the rising use of machine learning and generative AI held against a backdrop of politicised discourse and social media polemics, where views on what is "right", or "fair" increasingly diverge.

Our starting point is that "fairness" in health insurance involves equitable access to healthcare services, non-discriminatory practices and transparent communication between insurers and their customers. But this is not a trivial matter to deliver.

We recommend that insurers take the four-step approach to "fairness" shown in Figure 2.

FIGURE 2: FOUR-STEP APPROACH TO FAIRNESS



We cover the key elements of each of these four parts in this paper as short sections (Parts 1 to 4). We have also created four appendices as additional background on some of the key sections including:

- Overview of the FCA's Consumer Duty (Appendix A)
- Vulnerable customers (Appendix B)
- The EU AI Act and potential good practice implications for UK insurers (Appendix C)
- Introduction to algorithmic biases and testing (Appendix D)

6. Kollewe, J. (25 November 2024). FCA Is "Incompetent at Best, Dishonest at Worst," Claim MPs and Peers. Guardian. Retrieved 3 February 2025 from https://www.theguardian.com/business/2024/nov/26/fca-mps-peers-financial-conduct-authority-appg-report.

Part 1: Developing a framework for fairness

There is no unique definition of "what's fair." Any "fairness" approach needs to comply with legislation and regulation, but they need not be costly and burdensome. A robust, consistent and transparent approach requires a set of clearly articulated principles that can be put into practice. Developing such a framework starts by reflecting on "what's fair," considering legal obligations and embedding them into business operations, with a longer-term aim of generating greater societal values.

WHAT IS FAIR?

"That's not fair!" Whilst we have an innate sense of "fairness" from an early age, what makes something "fair" is incredibly hard to define. Key "fairness" principles include equality, need, deserts, recognition, participation and distribution.

For insurers, "fairness" could be stated as offering the same price to everyone or offering the same value to everyone—those two options have very different outcomes for individual customers. In practice, it is mathematically impossible to be entirely equal on pricing and value when there is a link to the risk profile of the customers. If Group A customers cost more to insure than those not in Group A, one would have to price differently or offer different value to the two different customer groups.

Insurers need to consider how they should define "fairness" for all their customers, understand applicable regulatory requirements and reflect on the implications for their customers, their brands, values and any other reputational risks before settling on an approach.

Is what is in your control "fair" to use for pricing health insurance?

With greater focus on protected characteristics, there has been a move to greater use of "lifestyle" factors as personal "choices."

Certainly, smoking is widely accepted as a choice. Possibly exercise; but are postcode, income, occupation, education, children? Whilst at some point they may have been "choices", at later points in life they may be fixed rather than changeable (or controllable).

And in case of further doubt, is medical history a "choice"—or only the medical history relative to lifestyle factors? This is clearly a highly complex question.

"Fairness" creates questions that sit at the heart of insurance pooling—which are the appropriate groups of risks to aggregate and price together.

REGULATORY EXPECTATIONS, ESPECIALLY CONSUMER DUTY

Regulatory expectations tend to focus on fair value, aligned suitability, good support, transparency and avoiding harms (especially to vulnerable groups or protected characteristics).

The UK Consumer Duty

In 2023, the UK Financial Conduct Authority (FCA) introduced a Consumer Duty regulatory framework (the Duty), which laid out higher standards of consumer protection and care. The aim is to require firms to act to deliver good outcomes for customers. The FCA defines cross-cutting rules providing clarity on their expectations under the Duty and helping firms to understand the four key outcomes relating to:

i. Products and services
ii. Price and value
iii. Consumer understanding
iv. Consumer support

It reflects a transition in regulatory expectations for insurers to consider the outcomes for consumers beyond a set of principles. The Duty also emphasises the importance of monitoring and reviewing outcomes to ensure that they remain aligned with consumer interests over time. Further details on the Duty are provided in the Appendix A.

For UK health insurers this combines providing fair customer treatment and clear information with products that genuinely meet their needs. Particular attention is required to product design and suitability, customer communication, customer support and providing "fair value" as well as systems to track performance and make adjustments. There is also a need to give special attention to vulnerable customers.

Vulnerable customers

Protecting “vulnerable customers” is a key focus for the FCA. It defines “vulnerable customers” as “someone who, due to their personal circumstances, is especially susceptible to detriment, particularly when a firm is not acting with appropriate levels of care.” The FCA wants “vulnerable customers” to experience outcomes as good as other customers and to receive fair treatment consistently across the firms and across all financial sectors.

There is a twofold perspective for health insurers. Firstly, for health insurance claimants, events or situations such as illness, disability, incident or death may mean higher states of vulnerability than average healthy and able individuals. This can be particularly true of mental health, and diagnosis of life-changing injuries and serious illnesses, but can apply to the stress, potential sleep deprivation or discomfort from any condition. Thus, an allowance for vulnerability, exercising a duty of care and acting with “fairness” within a health insurance company’s framework should be considered throughout the claim journeys of their customers. Customers’ claim journeys are considered in more detail in Appendix B.

The second is a general category of “vulnerable customers” which applies across all financial services reflecting their general susceptibility to detriment. It can be considered that all insurance policyholders who seek insurance covers have some basic awareness of “situations” that may expose them to some levels of vulnerability. Particular care is required for health insurance customers at the point of sale, including any medical underwriting that may apply, as it is key to have alignment of products that are suitable for their needs and circumstances, and effective processes to monitor and ensure that their outcomes are as good as other customers. A framework for identifying, assessing and monitoring outcomes for vulnerable customers is considered further in Appendix B.

International perspectives, data fairness and AI

The concept of data fairness, derived from various legal frameworks, has gained significant importance with the emergence of new AI regulations. In the EU, UK and US, relevant legislation on the topic includes insurance laws and regulatory guidelines from insurance regulators,[7] applicable and emerging AI laws,[8] as well as data privacy laws and regulations[9] (when personal data is involved). Additionally, non-discrimination laws[10] must be considered, which vary across jurisdictions both by focus and scope.[11] What it takes to be “fair”, along with duties, responsibilities, transparency, record-keeping and reporting, has become a critical element of regulatory compliance.

Protected characteristics

The UK Equality Act 2010 prohibits discrimination based on nine protected characteristics (age, disability, gender reassignment, marriage and civil partnership, pregnancy and maternity, race, religion or belief, sex, sexual orientation). Exact rules and application become complex quickly, but some differential treatments based on disability or age can be permitted if they are (statistically) relevant to the assessment of risks. Indirect discrimination rules can also be complex but may not be considered discriminatory provided they can be justified as a proportionate means of achieving a legitimate aim.

7. E.g., in Europe: the European Insurance and Occupational Pensions Authority (EIOPA) AI Governance Principles in the European Insurance Sector, 2021. In the US: Colorado, SB21-169; New York, AB 843 on Motor Vehicle Insurance Discrimination (Bill); Louisiana, LA H67 (Bill on Predictive Models Using External Consumer Data and Information Sources, or ECDIS); Illinois, H4611 on Motor Vehicle Insurers’ Use of ECDIS; Pennsylvania, HB 1663 (for health insurers using AI-based algorithms).

8. In Europe: Regulation 2024/1689 on Artificial Intelligence (EU AI Act) has various provisions on data fairness; In the UK, current existing sectoral laws impose guardrails on AI systems while awaiting comprehensive AI regulation. However, data fairness appears to be a best practice. In the US: the Colorado AI Act (SB-105) has specific provision on algorithmic discrimination. The US has a wide range of AI bills across various states that include data fairness requirements.

9. Europe: General Data Protection Act 2016/679; UK: Data Protection Act 2018; US: Currently, state data privacy laws are applicable in California, Colorado, Connecticut, Montana, Oregon, Texas, Utah and Virginia. Other state privacy laws are expected to enter into force from 2025. These laws provide specific fairness provisions, particularly in the context of automated decision tools and profiling involving the processing of personal data.

10. The EU has a comprehensive legal framework to combat discrimination, shaped by the laws of the Council of Europe and specific EU legislation. This framework is implemented through directives that Member States must adopt, ensuring consistency. The UK has the Equality Act 2010, which protects people from discrimination in the workplace and in society. The US relies on a combination of various federal laws and agency regulations, some of which are particularly relevant in the insurance sector.

11. For example, insurance laws may cover algorithms (computational or machine learning processes), predictive models or even “actuarial algorithms used to construct actuarial tables, coverage terms, premiums and/or rates” (NY AB 843); AI laws typically cover machine learning algorithms, automated decision tools or systems and (high-risk) AI systems. Data privacy laws cover the processing of personal data or personal information involving an automatic decision-making process or profiling.

Additionally, in 2012 the European Courts of Justice (ECJ) ruled against the insurance provision in the European Gender Directive. This means EU and UK insurers cannot use gender as a factor to differentiate premiums charged to consumers. Whilst post-Brexit this requirement may be now revoked in the UK, most commentators believe a change unlikely. The degree to which indirect gender discrimination needs to be avoided is not clear.

More generally, indirect discrimination in insurance is a rising political question. Whilst the EU AI Act does not apply to the UK, it reflects a growing attention to uses of AI and fairness. In its 2024 "Popping the Bonnet" report,[12] Citizens Advice highlights an annual £250 "ethnicity penalty" in car insurance that has persisted despite being highlighted for several years. Additionally, the recent All-Party Parliamentary Group report excoriated the FCA for its weaknesses in addressing customer harms. Combining these factors together, a focus on discriminatory pricing and potential "fairness" requirements for the use of AI could well follow.[13]

BEYOND THE REGULATIONS: ACCEPTABILITY, CORPORATE BRAND AND VALUES

Transparency and acceptability

An increasingly prominent aspect of "fairness" is participation. A connected digital world has brought expectations of consultation—and a lack of justice in decisions being made by remote bodies. In the UK, there has been increasing participation through use of citizens' assemblies and panels by select committees, local and regional governments covering policing, climate and justice.[14] There is an increasing expectation in the consultation and engagement of those affected for processes to be considered "fair."

Within the EU AI Act, there is a need for transparency in the role and use of AI and, at a minimum, it could be hard to classify a system as fair if its approach and testing of "fairness" is not transparent.

Alongside transparency is explainability and acceptability. For example, is it OK to use AI factors that don't have clear narratives or rationale? On acceptability, are there non-protected characteristics or information sources that are not appropriate to use—for example, recent bereavement or a Facebook-based "sociability" score? A framework can help determine responses to these types of questions and potential limits to data used within internal pricing and underwriting models.

Aligning with corporate values and brand

Insurers' practices have often gone beyond the narrowest interpretation of regulatory duties. This is true in the case of life with-profits contracts, where "reasonable expectations" is a significant element, and mutuals can have specific inclusion or pricing criteria defined.

But beyond these factors is a question of the corporate values and brand, which may also reflect its social purpose. Many health insurers have mission statements and values which reference some or all of the five dimensions of a health system's "Quintuple Aim": enhancing patient experience, improving population health, reducing costs, promoting provider well-being, and advancing health equity.

In the Quintuple Aim, health equity unambiguously connects to "fairness". But reflecting on each dimension element in turn quickly identifies some underlying systemic issues from gender and racial biases in patient experience, inequalities in population health and access and different burdens and strains across provider groups. Reducing costs may seem a universal good, until the impact on "fairness" is examined—for example, does switching to use bioidenticals disproportionately impact one gender? Does an emphasis on the use of evidence-based clinical pathways and value-based frameworks in provider reimbursement account for the lack of representation in clinical trials of ethnic minorities, or vulnerable customers with chronic comorbidities?

12. Citizens Advice (31 July 2024). Popping the Bonnet: Exploring Affordability Issues in Car Insurance and the Ethnicity Penalty. Retrieved 3 February 2025 from https://www.citizensadvice.org.uk/policy/publications/popping-the-bonnet-exploring-affordability-issues-in-car-insurance-and-the-ethnicity-penalty/.

13. Minty, D. (5 December 2024). What the FCA's Problems Bode for Insurers. Ethics and Insurance. Retrieved 3 February 2025 from https://www.ethicsandinsurance.info/what-the-fcas-problems-bode-for-insurers/.

14. Day, C. (19 April 2024). Empowering People: Unlocking Democracy's Superpower. Gov.UK Civil Service blog. Retrieved 3 February 2025 from https://civilservice.blog.gov.uk/2024/04/19/empowering-people-unlocking-democracys-superpower/.

DEVELOPING A FAIRNESS FRAMEWORK

Ultimately these different factors need to be brought together. There is no unique answer to "fairness", so a consistent approach will need to be written down with its principles outlined. Those simply looking to be compliant will focus on the regulatory needs and how they can best adapt them to their business. Through the Consumer Duty of acting in good faith, and customer support, a degree of transparency and articulation of these principles would certainly be best practice if not explicitly required.

Those looking to integrate a broader perspective and align with corporate and brand values as a competitive and commercial advantage, will wish to develop "fairness" further. It can be instructive to consider each of the academic fairness principles in turn: equality, need, deserts, recognition, participation and distribution, alongside an overarching need to deliver good outcomes and fair value for money. For health insurance, customers perceive fair value for money as part of their overall health and well-being initiative, so recognising that customers' participation in preventive care and well-being programmes can be key to providing "fairness" in a health insurance product and service offering. Furthermore, customers' participation or membership via a health app or web portal is an effective way of getting direct input from customers to ensure their feedback is part of the insurer's regular monitoring and evaluation.

Finally, and particularly for mutuals and leading brands, there are questions not only of transparency but also questions of the recognition and participation of policyholders in the process. Fundamentally, who gets to decide what's fair? Should policyholder representation be part of a health insurer's pricing and underwriting governance, ensuring that effective input and voices of "fairness" are upheld in the agenda and part of a "fairness" decision-making process? We can look across other insurance sectors for best practices. For example, there are governance models such as with-profit committees or independent governance committees that represent policyholder interests and value for money. We consider that these efforts can be a best practice governance framework for the health insurance sector and help tap into consumer groups' understanding of "fairness" and how their expectations evolve over time.

Part 2: Integrate into operations

Having developed a framework, the next step is to integrate it into operations, translating the principles into practical policies and guidelines using appropriate tools and methodologies. This starts with pricing, underwriting and product design and naturally leads into application in the growing use of AI. Customer services and ensuring "fairness" in quality of care received along with broader aspects such as fairly balanced expense allocations to determine value for money.

PRICING AND UNDERWRITING

Pricing and underwriting a health insurance product is a key challenge with annual medical claim inflation typically being higher than the consumer price index (CPI), and against the backdrop of the highly politicised state of national health systems in the UK as well as across the globe. Ensuring that products are developed, underwritten and charged fairly to health insurance customers is more important than ever, given such a challenging backdrop and the environment within which health insurance companies often operate. Pricing unfairly, or if customers perceive the premium they are charged or treatments and benefits they receive to be unfair, and the stance of the insurer is highlighted in the media, it could have a significant damning negative effect on the reputation of a health insurance company.

Best practices include (but are not limited to):

- Data-driven analysis and quantification approach
- Clear documentation
- Being transparent with customers, in particular with terms and conditions around the inclusion or exclusion of preexisting medical conditions, any moratorium and exclusion of any specific types of treatments (often highly complex, severe conditions)
- Being clear and signposting these policies using laymen terms in the policy documentation so there is no ambiguity.

Risk-based pricing and underwriting approaches should be auditable with clear accountability and robust governance of decision-making processes.

MEDICAL UNDERWRITING

There are typically several types of medical underwriting, depending on the complexity and comprehensiveness of the coverage in a health insurance policy:

1. **Full medical underwriting:** A comprehensive evaluation of an applicant's medical history and current health status. This type of underwriting involves detailed health questionnaires and may include medical records review. More commonly used for a comprehensive private medical insurance cover and retail healthcare plans with coverage of complex cancer treatments with associated high costs. Both questionnaire and general practitioner (GP) and/or specialised assessment approaches may apply. It is important to consider how questions are asked to ensure a clear, objective and, hence, fair assessment of an applicant's medical and health status.
2. **Moratorium underwriting:** Excluding any preexisting conditions for a set period, but without asking any specific questions on the current state of health. For any claim, the insurer has to determine whether the medical condition was "preexisting". "Fairness" considerations apply to both claiming customers and to whether the customer could have reasonably known of this condition when taking out the policy.
3. **Simplified issue underwriting:** A less intensive form of underwriting that relies on a significantly shorter health questionnaire without requiring detailed medical records. It is quicker but still assesses some level of risk.
4. **Guaranteed issue underwriting/medical history disregarded:** No medical questions are asked, and coverage is guaranteed regardless of health status. This type of underwriting is common for corporate group plans and certain types of health plans funded through health trust in the UK.

The key principles and practices to ensure the medical underwriting approach aligns to the "fairness" framework are transparency, consistency of decision-making and clear communication on the approach and its implications. Medical guidelines should be regularly updated so that declines, exclusions and/or any loadings can be justified on an ongoing basis based on new medical evidence.

Care is required to ensure that the underwriting approach does not impair reasonable coverage and value for money. For example, a customer with significant preexisting conditions who elects to have moratorium underwriting rather than undergo full medical underwriting may find that, in practice, their coverage is extremely limited.

Offering choices of loadings, and/or covering as many circumstances as possible with benefit limits that are clearly signposted and communicated, are approaches to consider. For example, are there practical approaches to ensure that the needs of certain vulnerable groups of customers are met and they are treated fairly? Current UK market practices generally exclude preexisting conditions rather than offering coverage with additional loadings.

AI USAGE

There is an increasing regulatory focus on the use of AI. The EU AI Act classifies the use of AI systems and life and health Insurance as "high-risk," which leads to high regulatory focus and a number of explicit requirements. The UK government has held back from new regulation but outlined five principles to apply to existing regulatory frameworks— (1) safety, security, robustness; (2) appropriate transparency and explainability; (3) fairness; (4) accountability and governance; and (5) contestability and redress).[15]

From a "fairness" perspective, several aspects of AI and especially generative AI (Gen AI) tools usage will require specific attention including but not limited to:

- Considering pre-screening of data to reduce risks of up-front biases and outcome testing for "fairness".
- Explainability and transparency: In particular, the ability to provide sufficient explanation to allow contestability of automated decisions.
- Treatment of vulnerable customers and role of human oversight.
- Robust enterprise-wide AI model risk management and governance.

Whilst the UK has yet to define AI, the EU takes a broad base that can include machine learning and data inference. So, whilst it may prove more than required for future UK regulations, it may be simplest, and best reflect global practice, to use the EU's broad definition.

15. See Appendix C, The EU AI Act and Potential Good Practice Implications for UK Insurers, for more details.

Customer services, quality of care and overcoming structural biases

Customer service is a key interaction where "fairness" gets applied. Almost all customers making health claims are vulnerable to some extent, with particular efforts required to meet the needs of the most vulnerable. Specific attention is needed to avoid behavioural and unconscious biases, with an awareness of the potential negative mental and psychological effects on customers who are receiving treatment or care, or about to do so.

The second element is "fairness" in the quality of care received. Ensuring there is "fairness" in the access to suitable healthcare pathways, and that treatments and options are apportioned to medical or disability needs. There are widely recognised structural biases in healthcare, especially along gender, socioeconomic and racial lines.[16] In acting "fairly," insurers should consider the degree they need to act with to overcome these structural care biases and ensure they are not inadvertently reinforcing them with their provider profiling and reimbursement practices.

Sustainable business model

The health insurance industry in the UK is integral to the national healthcare system. The National Health Service (NHS) has been facing significant challenges on several fronts in recent years—among them are a waiting-list backlog of circa 7.5 million people awaiting treatments and care, budget and funding constraints and staffing shortages. The UK private health sector, including insurance companies, can play a key role in partnering with and supporting the public sector to provide the population with faster and better access to necessary treatments and preventive care—an integral role in ensuring that the national healthcare systems are sustainable, equitable and capable of providing high-quality care to the population. However, the sustainability of health insurance companies is often challenged by rising healthcare costs and medical inflation, regulatory changes and evolving consumer expectations.

To navigate these challenges, health insurers should adopt innovative business models that ensure long-term viability. Two key strategies that can contribute to a sustainable business model, from a "fairness" perspective, are:

1. **Vintaging:** Refers to the practice of grouping policies based on their inception dates and/or by the year they were issued. This method enables the insurer to track the performance of different cohorts over time and make more informed decisions about pricing, product development and risk management. By analysing the performance of different vintages or cohorts, insurers can identify trends and patterns in the claims data and in lapses experience data. This helps in understanding the risk profiles and behaviours of different policyholder cohorts and adjusting premiums accordingly, which in turn allows insurers to set more accurate (or fair) premiums. This reduces the likelihood of underpricing or overpricing policies, which can impact profitability and customer satisfaction (or the value customers perceive to be getting from their insurers). Furthermore, insights gained from vintaging can inform the development of new products tailored to the needs of specific customer segments. This can lead to more competitive offerings and higher customer retention rates. Such an approach supports the need to treat different segments of customers, including vulnerable segments along a spectrum of vulnerabilities, fairly.
2. **Experience sharing:** Involves the exchange of data, insights and best practices among health insurers, healthcare providers and other stakeholders in the healthcare ecosystem. This collaborative approach can drive innovation and data-driven decision making, improve service delivery and enhance the overall sustainability of the health insurance business model. Collaborations between health insurers and healthcare providers, across both private and public sectors (including the NHS), can lead to the development of integrated care models that improve patients' outcomes and satisfaction; for example, providers who offer preventive care programmes, chronic disease management and wellness initiatives, leading to more holistic approaches to providing high-quality treatment and preventive care. Furthermore, partnerships with the public sector including the NHS should improve the population's access to better and faster treatments and quality of care, contributing to the sustainability of the healthcare ecosystem.

16. E.g., discussions in https://blogs.lse.ac.uk/politicsandpolicy/womens-health-history-and-the-uk-gender-gap/ and https://www.kingsfund.org.uk/insight-and-analysis/long-reads/health-people-ethnic-minority-groups-england.

To successfully implement vintaging and experience sharing, health insurers need to invest in robust data analytics capabilities and foster a culture of collaboration and a customer-centric focus. The following key considerations are some of the best practices observed in the market:

- **Invest in technology**: Advanced data analytics tools and platforms are essential for effective vintaging and experience sharing. Health insurers should invest in technologies that enable real-time data collection, analysis and reporting.
- **Build strategic partnerships**: Collaborating with healthcare providers, other insurers and industry associations can facilitate the exchange of data and best practices. Establishing formal partnerships and data-sharing agreements can enhance the effectiveness of experience sharing.
- **Foster a culture of collaboration**: Encouraging a collaborative mindset within the organisation is crucial. This involves breaking down silos, promoting open communication and incentivising employees to share insights and ideas.
- **Ensure data privacy and security**: Protecting the privacy and security of customer data, including sensitive health data, is paramount. Health insurers must implement robust data protection measures and comply with relevant regulations to maintain trust and avoid legal repercussions.

Other practical considerations[17]

Key areas that health insurance companies should review in light of fair value to customers are how broker commissions and expenses are allocated and how they are structured, e.g., a percentage loading of premium is a common approach. The percentage loading approach or structure should be reviewed to ensure that certain segments of customers do not get overloaded and pay out more than they should.

The Consumer Duty sets out the practices of differential pricing for renewing and new customers, requiring the removal of a "loyalty penalty." This raises a question of price insensitivity—and whether it is appropriate (fair) to charge a group of customers more, simply because they do not exhibit the same level of price sensitivity.

Vulnerable customers with characteristics such as a low level of literacy or arithmetic and financial capability should be considered and treated justly separate from those who are highly literate, for example through certain distribution channels that tailor to vulnerable customers' needs.

Reasonable judgement (and robust internal governance process) must be exercised when determining appropriate levels of expense loadings when pricing for different segments of customers, taking into consideration the spectrum of vulnerability and ensuring fair pricing that does not result in excessive margins.

Part 3: Assurance process

"Fairness" is not simple to define and deliver. Outcomes need to be continually tested and monitored within robust assurance processes. Direct efforts include work on algorithmic testing and the claim journey. There is also a broader societal aspect of financial inclusion, affordability and accessibility of healthcare and reducing protection gaps. While some of this societal perspective may fit with corporate social responsibility initiatives, addressing unmet needs can clearly represent self-interested growth opportunities.

ALGORITHMIC TESTING

Traditionally, insurers have often applied a "fairness through unawareness" approach, where the sensitive attributes are excluded during the model training and calibration. However, this method is often insufficient, as other correlated variables can still introduce bias. This is becoming particularly true with the use of big data and AI, whereby hidden correlations may be identified with the potential to perpetuate historical biases in the data.

There is thus increasing industry awareness of the need to address algorithmic biases with a more proactive approach, ideally implementing "fairness" and bias remediation approaches throughout the modelling process. Adding constraints to a model will inherently create a trade-off between performance and reducing bias. Inevitably, this leads to an iterative approach to both remove direct correlations and then adjust for indirect biases. Further details on algorithmic bias and testing are provided in Appendix D.

17. See also "Anti-Discrimination Insurance Pricing: Regulations, Fairness Criteria, and Models," Xin and Huang (2021) at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3850420 and The Discriminating (Pricing) Actuary; Frees & Huang (2021) at https://www.tandfonline.com/doi/full/10.1080/10920277.2021.1951296.

CUSTOMER CLAIM JOURNEY

Health insurance claim journeys can be closely intertwined with individual clinical and/or healthcare treatment pathways. When customers are on a claim journey, their main focus is to get well soon—be supported and helped through their journeys as smoothly and as hassle-free as possible. Health insurers should ensure this aspect of fair treatment and the high duty of care is at the front and centre of their firms' strategies and objectives.

Treating health insurance customers fairly with utmost duty of care can be considered and factored into the "end-to-end" pathway or journey in line with the Consumer Duty principles. The following are key considerations or practical steps that a health insurer could take in supporting and providing for its customers from a "fairness" perspective:

1. Ensure customers understand what they can claim and what is excluded, and up to how much (if there are limits, and under what conditions). Preexisting medical exclusions and/or moratoriums and waiting periods must be clearly communicated.
2. Ensure customer service and claiming process is made easy or simple for customers to follow, e.g., easily accessible 24/7 helpline, digital app available to customers to request a claim assessment and treatment and to report a claim and have it settled.
3. Claiming events are well-defined and linked to the spectrum of vulnerability assessed for that particular customer segment. Evaluate appropriate practical actions to address customers' needs if vulnerability is escalated in terms of severity.
4. Treat customers with utmost care and respect throughout the journey and their treatment pathways (ensures staff are well trained to detect, recognise, identify and deal with stressful situations). Exercise prudence, due care and consideration as well as empathy and kindness values.
5. Ensure there are specialised customer services for the most vulnerable customers who are making claims (for example in circumstances where customers have a disability or lack the literate ability to make informed decisions that are best for their circumstances).
6. Ensure data and systems record customers' feedback and satisfaction scores that can be fed into ongoing evaluation and monitoring. This includes both patient-reported experience measures (PREMs) and patient-reported outcome measures (PROMs).

SOCIETAL INCLUSION

The recent Pacific Life Re report "Beneath the Surface Serving the Underserved 2024"[18] considers how well the UK insurance industry is currently serving different customer segments. This is based on life and non-life products, with penetration into different communities and the level of coverages reviewed in a two-by-two grid.

Identifying gaps in coverage represents new business opportunities. The Pacific Life report identified an array of barriers, including awareness, marketing messages and historical perceptions of insurance bias and value for money. It then identified potential enablers, different business channels and the role of family and friends with life events as a key trigger to review and purchase protection. Key lessons and positive actions can equally be applicable to the health insurance sector.

Understanding where communities are underserved, both within your own business, and that of the industry, offers an opportunity. It can be a lever for business growth, a societal gain from inclusion—and help align "fairness" goals to the real-world impact of the business.

18. Pacific Life Re (2024). Beneath the Surface : Serving the Underserved. Retrieved 3 February 2025 from https://www.pacificlifere.com/content/dam/plre/Pacific%20Life%20Re%20-%20Beneath%20the%20surface%20Report%202024.pdf.

Part 4: Horizon scanning

Whilst philosophical concepts of “fairness” predate the Greeks, “fairness” practices and expectations often shift significantly in short timeframes, thus frameworks need regular reviewing. Horizon scanning helps challenge existing practices and identify emerging trends and developing expectations. Consumer group campaigns along with EU and international regulatory trends can be helpful horizon indicators. Beyond them are shifts in medicine, medical ethics and especially the emerging personalised medicines which are likely to put a continual spotlight on the challenge for fairness, trust and privacy.

EU AND GLOBAL RULES, CONSUMER GROUP CAMPAIGNS

“Fairness” is neither simply defined nor a stationary concept. Staying abreast of best practice will require ongoing review and horizon scanning. Global standards, and particularly those from the EU, help indicate emerging trends. Consumer groups’ campaigns often indicate future trends—and the recent All-Party Parliamentary Group (APPG) report excoriating the FCA protection of consumers[19] may make this a particular UK focus in 2025.

Within the UK, there may be particular focus on Citizens Advice’s "Fair Insurance Pricing" campaign and Macmillan Cancer Support’s "Right to Forget" campaign. Across the EU, the Anti-Discrimination Directive is seeking to ensure all individuals have equal access to insurance products and services, regardless of their personal characteristics, including reasonable accommodations for people with disabilities. EU insurers are developing new actuarial models that do not rely on prohibited factors and ensuring that all customers are treated equitably.

It is likely to be helpful to track the progress and practical implementation of the EU regulations, and implications of the rollout of community pricing such as that in Ireland, Germany and the Netherlands.

TRUST, PERSONALISED MEDICINE, PRIVACY AND FAIRNESS

Trust is a cornerstone of the relationship between health insurers and policyholders. Trust is built when policyholders believe that their health insurers act in their best interests, respect their privacy and provide fair coverage.

The focus on and the need for trust will grow exponentially with the explosion of genetic testing and personalised medicine. What becomes fair in cases of asymmetric information? In what ways is it fair to discriminate against a policyholder with a genetic profile that is known against one that is unknown? What are the ethics of the industry if risks of adverse pricing dissuade potential policyholders from getting genetic testing, when having the results could help them achieve better health?

Privacy is also a challenge. Both the direct safeguards, and what becomes appropriate to share across internal systems and externally. What are appropriate time limits on retention? Genetic information becomes complex when sharing information across families. Is there a particular duty to privacy where there are no current treatment options, or conversely a duty to disclose where it may radically alter and safeguard treatment options or preventive actions to other family members. Who carries that decision on family disclosure if the policyholder has impaired capacity to do so?

The challenges of balancing privacy against duty of care are emerging within NHS medical ethics committees.[20] Best practice and expectations are evolving and will be an important topic to keep under review.

19. FT Adviser (26 November 2024). FCA Branded ”Opaque, Unaccountable and Incompetent” by MPs. Retrieved 3 February 2025 from https://www.ftadviser.com/regulation/2024/11/26/fca-branded-opaque-unaccountable-and-incompetent-by-mps/.

20. BBC Radio 4 (20 August 2016). Inside the Ethics Committee, Series 12: Sharing Genetic Information. Retrieved 4 February 2025 from https://www.bbc.co.uk/programmes/b07nrxd4.

Appendix A: Overview of the FCA's Consumer Duty

In 2023, the UK Financial Conduct Authority (FCA) introduced a Consumer Duty regulatory framework (the Duty), which laid out higher standards of consumer protection and care. It came into force from 31 July 2023 for new and existing business and from 31 July 2024 for any closed products or services.

The Duty requires firms to focus on delivering good outcomes for consumers, based on the following three cross-cutting rules:

1. **Act in good faith:** Ensure that all actions and communications are honest, fair and transparent.
2. **Avoid foreseeable harm:** Take proactive steps to prevent potential harm to consumers, such as from misleading information or unfair terms, and to be up-front about costs and risks.
3. **Enable and support consumers:** Provide clear, accessible information and support to empower consumers to make informed decisions about their health insurance.

These cross-cutting rules are at the core of the FCA guidance[21] on how firms should act to ensure they can deliver *good outcomes*, i.e., ensuring that the products and services offered meet the needs of consumers, provide value for money, are understood by consumers and provide high-quality customer support.

The Duty also emphasises the importance of monitoring and reviewing outcomes to ensure that they remain aligned with consumer interests over time.

IMPLICATIONS FOR UK HEALTH INSURERS

The Duty aims to create a more customer-centric approach in the health insurance industry, ensuring that customers receive *fair treatment, clear information and products that genuinely meet their needs*. There are some significant implications in the following areas:

1. **Product design and suitability:** Health insurers should ensure that their products are designed to meet the needs of their target customers. This means offering coverage that is relevant and beneficial and avoiding overly complex products that customers might not fully understand.
2. **Customer communication:** Clear and transparent communication is crucial. Health insurers need to provide information that is easy to understand, helping customers make informed decisions about their health insurance policies. This includes clear explanations of coverage, exclusions (including preexisting medical exclusions), any changes to policy terms and conditions, reasons for changes in renewal premium rates etc.
3. **Customer support:** The Duty emphasises the importance of providing high-quality customer support. Health insurers should ensure that customers can easily access support and care services when they need them, whether they are for making claims, understanding their policies or resolving issues.
4. **Fair value:** Health insurers should demonstrate that their products offer fair value. This involves assessing whether the medical treatments, healthcare benefits and/or disability benefit protection covered under the policy or the health plan justify the cost to or premium paid by the customer. Companies should avoid excessive fees and premiums (and excessive profit) and ensure that customers are getting good value for their money.
5. **Vulnerable customers:** Special attention must be given to vulnerable customers, those whose *personal circumstances make them especially susceptible to detriment*, such as those with health conditions or financial difficulties. Health insurers need to identify and support these customers, ensuring they receive appropriate products and services that are tailored to their needs.
6. **Monitoring and reporting:** Continuous monitoring and reporting are essential to ensure ongoing compliance with the Duty. Health insurers should have robust systems in place to track their performance and make necessary adjustments to improve customer outcomes.

21. FCA (July 2022). FG22/5 Final non-Handbook Guidance for Firms on the Consumer Duty. Retrieved 4 February 2025 from https://www.fca.org.uk/publication/finalised-guidance/fg22-5.pdf.

The Consumer Duty remains an ongoing focus for the FCA, prioritising areas that can drive better outcomes and address potential harms. On 9 December 2024, it published four focus areas[22] that it will take into 2025. These areas include a cross-sector assessment on how well firms are implementing and complying with the Duty, enhancing the understanding of price and value outcomes, claim-handling arrangements and a call for input whereby the Duty can be used to simplify wider requirements (for retail firms).

Appendix B: Vulnerable Customers

The FCA defines "vulnerable customers" as "someone who, due to their personal circumstances, is especially susceptible to detriment, particularly when a firm is not acting with appropriate levels of care."[23]

Protecting "vulnerable customers" is a key focus for the FCA. The FCA wants "vulnerable customers" to experience outcomes as good as other customers and to receive fair treatment consistently across the firms and across all financial sectors. It highlights that this fair treatment should be embedded as part of a firm's culture. It should be embedded in policies and processes throughout the whole customer journey.

Firms are encouraged to think of vulnerability as a spectrum of risk with all customers susceptible to becoming vulnerable. This risk is increased by:

- **Health:** Health conditions or illnesses that affect the ability to carry out day-to-day tasks.
- **Life events:** Life events such as bereavement, job loss or relationship breakdown.
- **Resilience:** Low ability to withstand financial or emotional shocks.
- **Capability:** Low knowledge of financial matters or low confidence in managing money (financial capability). Low capability in other relevant areas such as literacy or digital skills.

Since the cost-of-living crisis, some estimates have suggested that over 50% of UK customers may have vulnerable characteristics,[24] particularly in the context of financial resilience. By definition, health insurance claims reported by customers will have meant that their medical or health/disability conditions and concerns have already happened, which means customers already have vulnerable characteristics and are susceptible to detriment.

Therefore, health insurers need to reflect on their duty of care throughout their customer journey—with awareness not only at the point of sale but throughout the consumer journey. What does a health insurer need to do? The FCA's infographic in FG21/1 Guidance[25] for firms on the fair treatment of vulnerable customers summarises the key actions firms should take and is shown in Figure 3.

It is important to monitor and consider customers' needs and potential vulnerability on an ongoing basis. The support given to customers when in good and in poor health is detailed further as part of the examples of good and bad practices in the FCA's vulnerable customer guidance. Examples that are relevant include impacts on ability to complete complex forms, reduced income, mental health and potential need to transfer responsibilities and administration to others during illness.

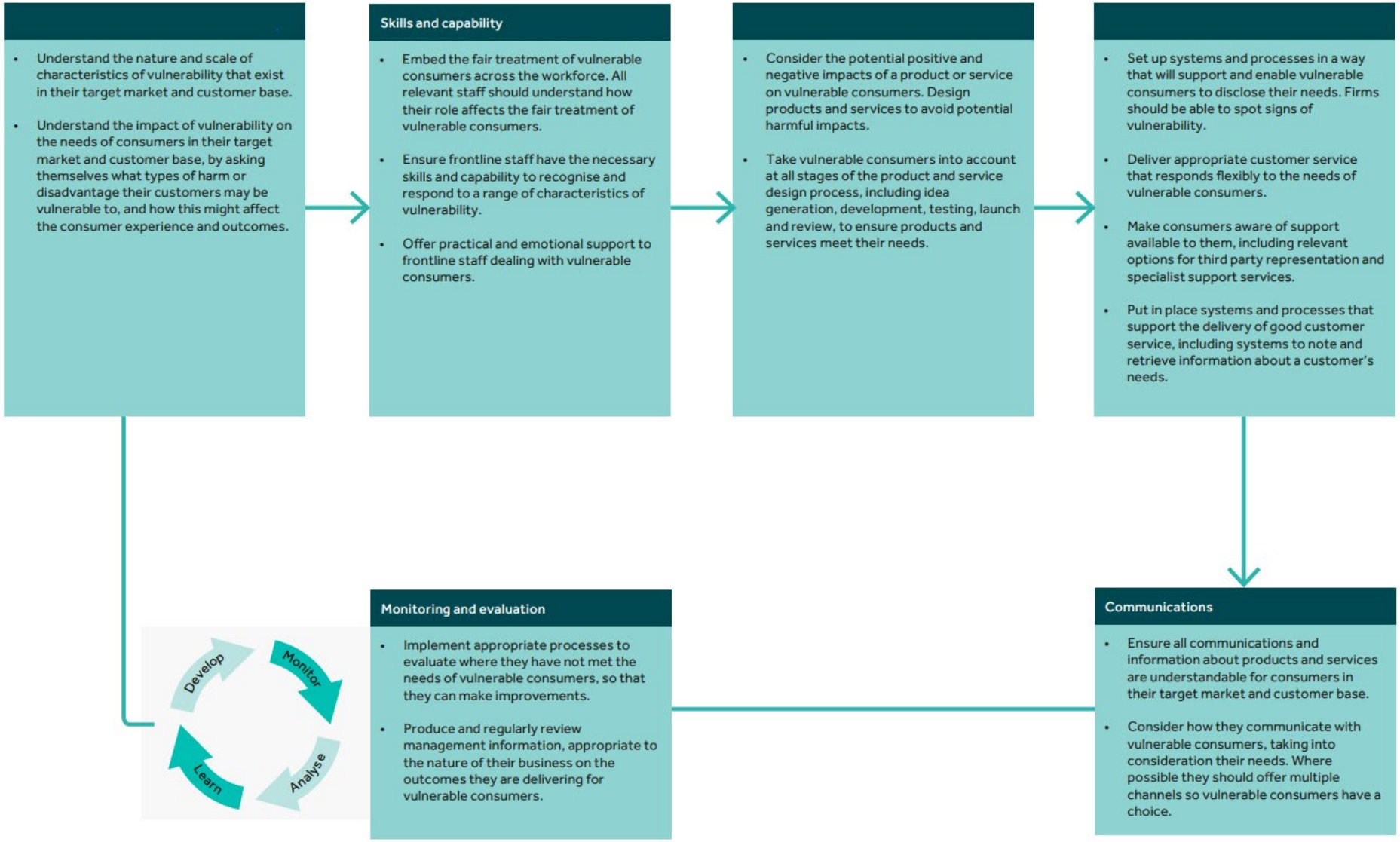
22. FCA (9 December 2024). Our Consumer Duty Focus Areas. Retrieved 4 February 2025 from https://www.fca.org.uk/publications/corporate-documents/our-consumer-duty-focus-areas.

23. FCA (February 2021). FG21/1 Guidance for Firms on the Fair Treatment of Vulnerable Customers. Retrieved 4 February 2025 from https://www.fca.org.uk/publication/finalised-guidance/fg21-1.pdf.

24. Swinscoe, A. (17 March 2024). Two-Thirds of UK Customers May Be Vulnerable but Not Obviously So. Forbes. Retrieved 4 February 2025 from https://www.forbes.com/sites/adrianswinscoe/2024/03/17/two-thirds-of-uk-customers-may-be-vulnerable-but-not-obviously-so/.

25. FCA (19 July 2021). Guidance for Firms on the Fair Treatment of Vulnerable Customers. Retrieved 4 February 2025 from https://www.fca.org.uk/publications/finalised-guidance/guidance-firms-fair-treatment-vulnerable-customers.

FIGURE 3: FCA INFOGRAPHIC ON FAIR TREATMENT OF VULNERABLE CUSTOMERS

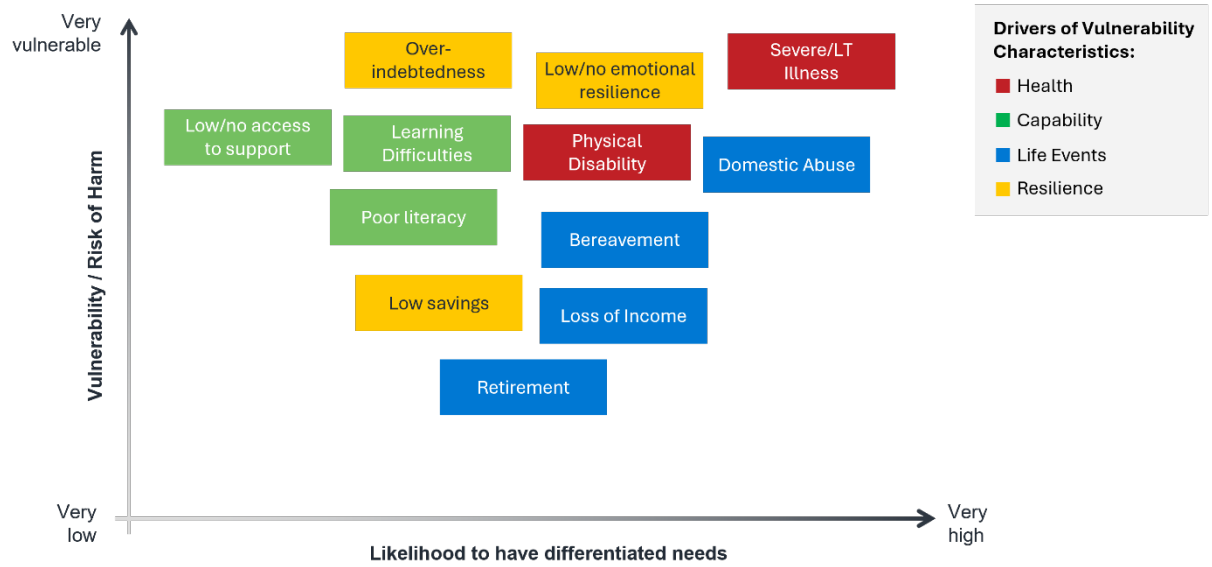


Based on the FCA's vulnerable customers guidance, we set out a practical example that can be followed or applied as part of an insurer's framework for identifying "vulnerable customers," based on its customers' characteristics, by segment or target market. The purpose is to aid the differentiation of the firm's approach to an appropriate duty of care and fair treatment of all customers based on where each group or segment is on the spectrum of vulnerability, assessed in accordance with the FCA's defined drivers of vulnerability characteristics. Health insurance companies may use the following as a guide:

1. Study your customer segments, profiles and target markets as part of the aim to define and understand your customers' needs—for both old or in-force and new customer segments.
2. Use an appropriate coding system to identify and assess each group using each of the drivers of vulnerability characteristics (health, life events, capability and resilience).
3. Identify where each group or segment is and plot them on the "Spectrum of Vulnerability" chart (an example chart is provided in Figure 4).
4. Monitor how each group is performing, for example using customer feedback and satisfaction scores such as Net Promoter Score (NPS), patient-reported experience measures (PREMs) and patient-reported outcome measures (PROMs). NPS alone is not sufficient and health insurers should include PROMs and PREMs as part of a more holistic approach to understanding customer/patient experiences and satisfaction.
5. Analyse by new and renewal group in each customer segment.
6. To monitor customer satisfaction effectively and deliver good outcomes, it is important to ensure that data and systems are capable of collecting, collating and reporting such metrics consistently over time.
7. Analyse the firm's actions for each group or segment. Use feedback loops to ensure actions are assessed and improvements are made over time.

A distinctive challenge to understand vulnerable customers is ensuring there is correct identification, real-time responsiveness to their needs and the ability to be dynamic in the appraisal. The level of vulnerability that customers experience can present a spectrum of needs and that can change over time. Care is also required to consider the potential weakness in customer feedback metrics. Reflecting on vulnerable customer needs can lead to opportunities and greater customer satisfaction from an inclusive design perspective. For example, no one likes completing complicated forms. Therefore, simpler designs can improve customer journeys as well as reduce error rates and missing data.

FIGURE 4: EXAMPLE PLOT OF THE "SPECTRUM OF VULNERABILITY" FOR A HEALTH INSURER'S CUSTOMER GROUPS OR SEGMENTS[26]



26. An example of the FCA "Spectrum of Vulnerability" chart, based on FCA guidance.

Appendix C: The EU AI Act and potential good practice implications for UK Insurers

The EU AI Act will apply to insurers that write business in the EU. For UK-only insurers, it does not directly apply but its principles are likely to be a significant influence on good practice expectations ahead of more specific UK regulation.

SUMMARY OF THE EU AI ACT

The European Union's AI Act (the Act) seeks to create a regulatory framework to ensure that artificial intelligence (AI) technologies are trustworthy, human-centric and aligned with the fundamental rights and values of the EU. It came into force on 1 August 2024, with the enforcement of the majority of its provisions commencing on 2 August 2026.

The Act introduces a risk-based approach to AI regulation, categorising AI systems into four risk classes: prohibited, high-risk, limited-risk and minimal-risk. In broad, nonlegal terms:

- **Prohibited AI systems:** These are systems considered contrary to EU values and principles, such as those that manipulate human behaviour, exploit vulnerabilities or cause social scoring. They are banned.
- **High-risk AI systems:** These systems pose significant risks to health, safety or fundamental rights of people or the environment. They are the focus of the regulations and expectations. Examples include AI used in critical infrastructure, education, employment, law enforcement and biometric identification.
- **Limited-risk AI systems:** These systems include chatbots and AI-generated content that are not used within high-risk contexts. Key requirements are around transparency to consumers.
- **Minimal-risk AI systems:** These systems are unlikely to cause any adverse impact on people or the environment, such as those used for video games, spam filters or personal assistants.

The Act has significant implications for EU insurers, as AI systems related to pricing and underwriting in health and life insurance are considered high-risk. Regulatory expectations and industry best practices are still to emerge, but note that the context of risk in access to services is quite broad, as they “may have a significant impact on persons’ livelihood and may infringe their fundamental rights, such as the right to social protection, non-discrimination, human dignity or an effective remedy.”

Finally, the Act’s definition of AI is quite wide, incorporating aspects of machine learning and data inference. So, depending on the model’s autonomy and adaptiveness, some traditional actuarial models may be defined as AI and thus part of the definition of a high-risk AI system.

THE ACT’S GOVERNANCE AND PRACTICE REQUIREMENTS FOR INSURERS

Beyond the regulatory registration, the Act has a range of obligations and responsibilities, including strict requirements on data quality, data fairness, technical documentation, human oversight, transparency and accuracy. Whilst efforts are emerging, these requirements are likely to become a basis for good practice unless proven to be hugely disproportionate. The Act requires:

- **Data quality and fairness:** Ensure that the data used in AI systems is of high quality, unbiased and representative of the population. Implement measures to regularly audit and validate data sources to maintain fairness and accuracy.
- **Technical documentation:** Maintain comprehensive technical documentation for all AI systems, detailing their design, development, and deployment processes. This documentation should include information on the algorithms used, data sources and any potential biases or limitations.
- **Human oversight:** Establish robust human oversight mechanisms to monitor AI systems' performance and decision-making processes. This includes setting up review boards or committees to oversee AI applications and ensure they align with ethical standards and regulatory requirements.
- **Transparency and accuracy:** Ensure that AI systems are transparent in their operations and provide clear explanations for their decisions. This includes informing users about the use of AI and offering opt-out options where applicable. Regularly assess and validate the accuracy of AI systems to maintain trust and reliability.

The UK currently relies on existing regulations to managing AI consumer risks. In February 2024, the government set out a cross-sector framework to AI regulation,[27] which held back on explicit requirements but set out five principles to be considered and applied with current regulatory regimes. These principles are (1) safety, security, robustness; (2) appropriate transparency and explainability; (3) fairness; (4) accountability and governance; and (5) contestability and redress. In April 2024 the FCA published a response,[28] largely mapping these principles to existing regulations although noting there is not an explicit regulation to address all aspects, in particular those on the transparency and explainability of AI systems.

Almost certainly more regulation will follow, and the EU AI Act is likely to form a natural starting point, particularly if it proves successful at managing risks without excessively restricting innovation. More broadly, these AI governance rules put a spotlight on model risk management. Whilst Supervisory Statement (SS) 1/23, "Model Risk Management Principles for Banks,"[29] from the Prudential Regulation Authority (PRA), doesn't yet apply to insurers, it is widely expected to follow and is an obvious opportunity to provide further guidance on AI governance.

Implications From a Model Risk Management Perspective

The Act is putting an additional spotlight on model risk management, especially due to its broad definition of AI. As seen in the FCA AI Update, much of these expectations are already within existing regulations. Thus, if AI governance and model risk management have not been recently reviewed, then it is worth considering AI within model risk management, including:

- **Inventory and classification**: List all AI applications currently in use within the company (both built in-house and externally bought) and classify them according to the different risk levels outlined in the AI Act.
- **AI governance board**: Set up a multidisciplinary AI governance board to oversee AI strategy, policy and compliance. This board should include representatives from data science, actuarial, legal and compliance departments.
- **Risk management standards**: Implement risk management standards to ensure AI systems undergo conformity assessments and are well-documented. Develop policies and procedures across the AI life cycle for the use and development of AI systems.
- **Regular monitoring and review**: Continuously monitor and review AI systems' performance and impact. Establish processes for regular audits and updates to ensure ongoing compliance with regulatory requirements and ethical standards.

It is yet to be seen whether a UK regulatory definition of AI will be as broad as the EU's but it is worth considering whether explicitly adding machine learning and data inference to the AI label would help the model risk management inventory and oversight.

27. Gov.UK (6 February 2024). Consultation Outcome: A Pro-Innovation Approach to AI Regulation: Government Response. Retrieved 4 February 2025 from https://www.gov.uk/government/consultations/ai-regulation-a-pro-innovation-approach-policy-proposals/outcome/a-pro-innovation-approach-to-ai-regulation-government-response.

28. FCA. AI Update. Retrieved 4 February 2025 from https://www.fca.org.uk/publication/corporate/ai-update.pdf.

29. PRA (17 May 2023). SS1/23 – Model Risk Management Principles for Banks. Bank of England. Retrieved 4 February 2025 from https://www.bankofengland.co.uk/prudential-regulation/publication/2023/may/model-risk-management-principles-for-banks-ss.

Appendix D: Introduction to algorithmic biases and testing

ALGORITHMIC BIASES

Algorithmic biases refer to systematic and unfair discrimination that can occur in artificial intelligence (AI) and broader machine learning (inference) systems.[30] These biases can lead to unequal treatment of individuals based on characteristics such as race, gender or socioeconomic status.

Types of algorithmic bias include

1. **Statistical biases**: These biases arise from systematic differences between estimates and reality. They often arise from inefficiencies of the methods used to process the data or from imbalanced representation in the dataset. For example, if the data used to train an AI model is not representative of the population it is meant to serve, then the model's predictions can be biased.
2. **Technological and measurement biases**: These biases occur when tools or algorithms function differently for certain groups. For instance, facial recognition technology has been shown to be less accurate for people with darker skin tones. This disparity can lead to unequal outcomes for different demographic groups.[31]
3. **Cognitive, historical and societal biases**: These biases are embedded in the data and algorithms due to historical and societal prejudices. For example, if historical data reflects gender discrimination premium charges, then an AI model trained on this data may perpetuate these biases.

DIFFERENT APPROACHES TO FAIRNESS METRICS

Three distinct metrics for measuring "fairness" are demographic parity, equalised odds and predictive parity. Unless the characteristics being examined are independent of the risks, these metrics will give different results. Thus, it is critical to define the metric of "fairness" that will be used to investigate and assess the bias.

FIGURE 5: FAIRNESS METRICS

DEMOGRAPHIC PARITY	EQUALISED ODDS	PREDICTIVE PARITY
Demographic parity ensures that the prediction or decision of an AI model is independent of specific attributes such as race or gender. For example, in pricing, demographic parity would mean the same prices are charged to each group, for example male and female. This metric works well where the demographic and the risk are considered independent. However, it can be more challenging when the risk and the demographic are related, as one demographic will implicitly be subsidising the risk of the other.	Equalised odds focus on ensuring that individuals who qualify for a particular outcome are treated equally, regardless of their demographic group. In an insurance context, everyone generates an equal amount of profit. This metric is suitable when the risk or qualification for an outcome is related to the demographic attribute.	Predictive parity focusses on the accuracy of predictions for different demographic groups. It ensures that the positive predictive value—the proportion of positive predictions that were correct out of all positive predictions—is equal across different groups. Predictive parity is particularly relevant in scenarios where the accuracy of positive decisions (e.g., MRI referral, delayed claim payment) should be consistent across groups to maintain fairness.

30. The EU AI Act defines "AI system" to mean "a machine-based system that is designed to operate with varying levels of autonomy and that may exhibit adaptiveness after deployment, and that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments." See https://artificialintelligenceact.eu/article/3/. Its exact application requires legal analysis and some guidance is given in Recital 12 of the EU AI Act with further direction expected in upcoming guidance from the European Commission.

31. Where "demographic group" typically refers to a specific category of people with shared characteristics, such as age, race, or behaviour; skin tone as racial characteristic.

INTEGRATING BIAS REMEDIATION INTO THE MODELLING PROCESS

Traditionally, insurers have often applied a “Fairness Through Unawareness (FTU)” approach, where the sensitive attributes are excluded during the model training and calibration. However, this method is often insufficient as other correlated variables can still introduce bias. This is becoming particularly true with the use of big data and AI, whereby hidden correlations may be identified with the potential to perpetuate historical biases in the data.

Addressing algorithmic biases needs a more proactive approach to implementing “fairness” and bias remediation throughout the modelling process. Given models are optimised before any fairness constraints, there is an inherent trade-off between performance and reducing bias. An unconstrained model is likely to have higher predictive accuracy but can also exhibit significant bias. On the other hand, a model with fairness constraints may have lower accuracy but provide more equitable outcomes. It is essential to balance these trade-offs to ensure that the model generates the desired outcome or result that is fair, justifiable and effective.

A typical remediation approach would be to start by creating an unconstrained baseline model, which can be used to understand the extent of bias present in the initial predictions and as a performance benchmark for the fairness-adjusted model. The baseline can be compared to two alternative calibration approaches:

1. **Include the variable during development, then set coefficients to zero:** This has the advantage of direct control and highlights the influence of the variable within the unconstrained model. However, correlated influences from other variables may still exist and “fairness” needs to be tested. There is also an issue of trust for insurers, whether customers are comfortable in disclosing their data and in how their data will be protected and used.
2. **Exclude the variable during development, then correct the model afterward**: The sensitive variable is omitted during training, and corrective measures are applied afterward to address any residual bias. The challenge is that correlated influences in other variables are likely to be magnified in the developed model, making it complex to understand sensitivities and correlations that are true, which may require an iterative approach.

When working across multiple variables, the complexity grows, especially in addressing the residual bias impacts. These core approaches can be supplemented with techniques that improve the algorithms and reduce biases in the training data, for example:

- **Adversarial training,** which involves training the model with an adversarial network that attempts to identify and correct biases in the predictions. The adversarial network acts as a bias detector, and the main model is penalised for any biases detected.
- **Re-weighting,** which involves adjusting the weights of training samples to ensure that the model treats different demographic groups fairly. Samples from underrepresented or disadvantaged groups are given higher weights.

ALGORITHMIC FAIRNESS LIBRARIES

There are a growing number of open-source algorithmic fairness libraries available in Python, including IBM’s AIF360, Microsoft's Fairlearn, Google's Fairness Indicators and the package EquiPy. These packages primarily focus on demographic parity and alternative metrics for binary classification. As such, the open-source packages do not really offer a suitable framework for other types of tasks such as multi-class classification or regression with respect to key metrics like equalised odds and predictive parity. To tackle these challenges, Milliman has also developed its own internal tools for bias diagnosis and correction.

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Milliman leverages deep expertise, actuarial rigor, and advanced technology to develop solutions for a world at risk. We help clients in the public and private sectors navigate urgent, complex challenges—from extreme weather and market volatility to financial insecurity and rising health costs—so they can meet their business, financial, and social objectives. Our solutions encompass insurance, financial services, healthcare, life sciences, and employee benefits. Founded in 1947, Milliman is an independent firm with offices in major cities around the globe.

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