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Protecting the Public Interest in Insurance Pricing

Prepared by the Actuaries Institute Working Group for Professional Support for Actuaries involved in General Insurance Pricing

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Executive Summary

There is a growing need to review approaches to insurance pricing such that they continue to serve the public interest. This need for a review of insurance pricing principles has been highlighted by three overarching themes.

Firstly, community expectations, which are a function of social factors and society, evolve over time. The community has always expected high standards of conduct from financial institutions including insurers, and increasingly expects institutions to explicitly consider the perspectives of an increasing number of distinct and different customer groups. Community expectations regarding the pricing of insurance products, particularly around transparency and affordability, are topical, with an increasing onus on companies to explain and justify insurance pricing for different customer groups or individual customers. At the same time, inflation and other factors are driving up claim costs, and insurers must consider this in pricing products if they are to remain financially sound to pay claims when they are called upon. Insurers alone may not be able to fully meet the expectations of every stakeholder group in all situations. There are tensions, limitations and trade-offs involved with needs of different stakeholders which need to be considered, which we discuss in this paper.

Secondly, recent regulatory interventions in the insurance industry have highlighted issues in established pricing practices, which have not met customer and community expectations. Regulators in Australia and overseas have introduced stricter requirements for insurers to safeguard consumers' interests such as the introduction of product design and distribution obligations in Australia[1] and the consumer duty obligations in the UK[2]. Regulators have conducted reviews into insurers' pricing practices which uncovered several shortcomings in how insurers met their pricing obligations towards customers[3].

Thirdly, the rapid advancement of technology and data capabilities has led to more complex data processes, models and additional considerations which have introduced layers of complexity into pricing decision-making processes. These technology and data advancements could disrupt the balance among the diverse objectives of different stakeholders. Pricing decisions now carry a greater level of intricacy, requiring both risks and controls to be carefully reviewed.

In this context, insurance pricing and its feedback loop becomes more crucial than ever to align pricing approaches with evolving values of transparency, fairness, and a customer-centric focus. This alignment will consider the varied interests of stakeholders, reflecting a collective commitment to fairness and balance.

This Research Paper has been written to provide a thought stimulus for professionals working in insurance, including actuaries, with responsibility for and oversight of pricing-related functions. It discusses six principles we suggest be considered in a pricing process. The six principles are not intended to serve as the definitive list that must be considered, although it is important that each business has a set of principles that are well articulated, understood, applied and monitored to ensure there is strong governance. Each business situation is unique, and professionals should continue to use their best judgment regarding the relevance of the principles presented in this paper to their situation and the extent to which other factors exist.

[1] ASIC Regulatory Guide 274 (2020)

[2] FCA (2022)

[3] FCA (2021a), ASIC (2021), ASIC (2023b) and APRA (2022)

Principles for consideration and to inform a pricing process



A high-level definition of the six principles is detailed below. See section 2 for a detailed discussion on each principle.

- **Transparency and Disclosure**: consideration of availability and accessibility of relevant information to assist customers in making informed choices.
- **Value for Money and Affordability**: consideration of whether the cost of the premium to take out the product is commensurate with the benefits provided to policyholders, and of the extent to which an insurance premium for an appropriate coverage falls within the insured's capacity to pay.
- **Anti-Discrimination and Fairness**: balancing the diverse interests and objectives of different stakeholders, including consideration of direct and indirect forms of discrimination and of fairness (in particular, impacts to vulnerable groups or individuals).
- **Responsible and Appropriate Use of Data**: consideration of how data is sourced and used is consistent with what stakeholders would reasonably expect.
- **Avoiding Perverse Incentives**: product pricing and underwriting practices should not reward risk-seeking behaviour, environmental damage, or other negative externalities.
- **Sustainability**: ensuring the long-term viability and stability of products, and meeting the reasonable expectations of policyholders, through considerations such as predictability of pricing over time, financial outcomes that allow insurers to continue to provide cover to the market and pay claims, and other related outcomes.

Insurance pricing is closely intertwined with product design, underwriting and distribution of insurance products. In this paper, our focus is on pricing and tangential matters that are material and relevant to insurance pricing to support pricing practitioners.

It is recognised that there are tensions and trade-offs between different principles and between needs of different stakeholders impacted by a pricing decision. In complex situations like this, good practice involves analysing and evaluating the vulnerability of, potential harms to, and beneficial interests of each stakeholder. Pricing practitioners should also refer to any existing frameworks that may exist in their organisations and may find it helpful to seek advice and perspectives from a diverse range of experts, such as consumer groups, risk professionals and legal advisers.

1 Public Interest in Insurance Pricing

1.1 Responsibility to Protect the Public Interest

Actuaries have a responsibility towards protecting the public interest through the Actuaries Institute Code of Conduct[4] that requires them to observe principles in the code "in the public interest and to build and promote confidence in the services provided by actuaries and in the actuarial profession."

Directors and management of financial institutions, including insurers, in many jurisdictions have an obligation to exhibit fair conduct and act in best interests of certain groups of customers [5] . In the Royal Commission into Misconduct in the Australian Banking, Superannuation and Financial Services Industry, Commissioner Hayne pointed out "six norms of conduct" expected of financial institutions, namely, "obey the law; do not mislead or deceive; act fairly; provide services that are fit for purpose; deliver services with reasonable care and skill; and when acting for another, act in the best interests of that other."[6]

Some pricing considerations are complex and difficult for individual insurers to resolve by themselves. Such issues can require government and community consultation to resolve.

"Public interest" is a broad term which may apply to a wide group of stakeholders. In this paper, there will be a particular focus on public interest relating to community and consumer expectations of insurance prices.

1.2 Why is it Important in Insurance Pricing and Underwriting?

Insurance pricing and underwriting must balance shareholder and prudential interests (i.e. profitability and solvency) with customer and community interests. Important causes of past failures of insurance companies have been due to insufficient profitability and/or solvency[7], which are therefore important for customers and society to help ensure a viable and sustainable insurance market – one that is there for policyholders in the long-term to get claims paid, including through periods of stress that occur from time to time in insurance. Acknowledging that the appropriate balance and community expectations may evolve over time, recent regulatory interventions in insurance pricing practices (focused on customer and community expectations) have highlighted the importance of continually reviewing this balance.

There are distinct features of financial products, particularly insurance, that require great care with respect to public interest. Some of these include the following.

- **Gap in consumers' knowledge about insurance contracts**

Many consumers of insurance products do not have strong financial literacy (i.e. they are not equipped to fully understand details of these complex financial products), or they may not spend the time to read and understand the terms. Misunderstanding coverages is a common source of disputes between an insurer and its customers at the time of a claim. Therefore, how this gap is minimised is an important consideration for insurance products.

[4] Actuaries Institute (2020a)

[5] For example, ASIC Regulatory Guide 175 (2021) and Corporations Act, 961B (2001)

[6] Hayne (2019)

[7] Massey et al. (2002)

- **Compulsory products**

Some general insurance products are compulsory in certain jurisdictions, for example, third party bodily injury insurance for motor vehicles and insurance for workplace injuries. For compulsory third party insurance which is often designed to compensate an injured party, Newton et al. (1999) state that "it is in the public interest for the innocent third party to be compensated promptly and fully, without having to negotiate too many obstacles." Another consideration for compulsory insurance observed by Newton et al. is that "all those requiring compulsory cover are able to buy it at affordable rates." Finally, there is a consideration of reasonableness of profits and paying claims efficiently. Such considerations for compulsory products are often legislated. For group life insurance provided on a default (opt-out) basis, similar considerations are also relevant.

- **Asymmetry of knowledge between insurance companies and customers**

With an insurance product, the insurer and its customers both have knowledge unavailable to the other party from which they have the potential to benefit. Customers often have a better understanding of their risks that may not be encoded into data. As a result, the balance of information asymmetry can be considered to favour customers.

However, in the modern economy an insurer may have access to significant amounts of information about risk that a customer does not have access to or have general knowledge about, as well as a much better understanding of a product's coverage and benefits, and how a contract will operate in the event of a claim. Additionally, through large datasets and predictive models, insurers may increasingly have knowledge of how customers are likely to behave and can nudge them into specific behaviours. For products where such information is available, this has provided some advantage to insurers that may partially offset asymmetry favouring customers.

A healthy insurance market requires all parties to act in good faith, and this includes sharing information in good faith. The duty of utmost good faith applies to all aspects of the relationship between an insurance company and the insured person, and requires both parties to a contract to be transparent with each other and for material facts to be disclosed. It also applies to any third-party beneficiary to the contract.

Both life insurance and general insurance Codes of Practice[8] in Australia articulate insurers' obligations to fairly share information with consumers, with recent enhancements to complement more longstanding disclosure obligations.

- **Social purpose of insurance**

Insurance provides a social purpose, that goes beyond the protection benefits provided to policyholders. The social purpose of insurance includes:

  - assisting in community recovery following a disaster or an extreme adverse event;
  - freeing up businesses and individuals from everyday risks and encouraging innovation, competition and rational risk-taking;
  - relieving the burden from the state in providing a social safety net; and
  - keeping the economy moving forward by providing peace of mind in an uncertain world.

[8] CALI (2023) and Insurance Council of Australia (2021), noting the General Insurance Code is currently undergoing a review as announced in Insurance Council of Australia (2023).

- **Uncertain future outcomes**

Insurance is a product for which prices are set based on uncertain future outcomes. An insurer needs to ensure it charges sufficient premiums to support financial viability to pay future claims – which is a feature of insurance in the public interest, but this is often not apparent to consumers and the general public. Given the uncertainty of future outcomes, particularly at an individual level, financial viability and the public interest are only supported when pricing reflects an appropriate allowance for uncertainty. However, this should not be taken to mean that all uncertainty is readily quantifiable, and care is required to balance the public benefit of surety of financial viability with other public interest considerations such as affordability.

2 Principles for Protecting the Public Interest in Insurance Pricing

This section discusses a set of principles for consideration in a pricing process:

- Transparency and Disclosure
- Value for Money and Affordability
- Anti-Discrimination and Fairness
- Responsible and Appropriate Use of Data
- Avoiding Perverse Incentives
- Sustainability

These principles are not intended to be the definitive list, although it is important that each business has a set of principles that are well articulated, understood, applied and monitored to ensure strong governance. Each business situation is unique, and professionals should use their judgment on how these principles may relate to their situation.

A key difference that distinguishes insurance contracts from ordinary commercial contracts is the concept of utmost good faith, whereby it is incumbent upon both the insured and the insurer to exercise utmost good faith in their negotiations.[9] All principles discussed in this section are underpinned by the principle of utmost good faith. Some principles in this section go beyond the principle of utmost good faith, for example Value for Money and Affordability discussed in section 2.2 – which tries to ensure that once an insurance contract is valid, it is also of value.

Many principles discussed in this section may already be a feature of the law in some countries. It is noted that compliance with the law is the minimum requirement that insurers must meet. In relation to pricing, many countries have regulatory requirements for anti-competitive behaviour; customer disclosures; offering products that are fit for purpose and sustainable; avoiding unfair discrimination and data privacy. It is not the intention of this paper to cover all aspects of insurance laws. A specific discussion of Australian regulatory requirements relating to insurance pricing is covered in Appendix A.

Other than the law, principles discussed below may come from professional standards, industry codes of conduct, and ethical or community expectations.

2.1 Transparency and Disclosure

A fair and well-functioning insurance sector requires consumers to be well-informed. Consumers' ability to make efficient and appropriate choices with respect to insurance can be enhanced by the availability and accessibility of relevant information disclosed. Conversely, a lack of transparency or effective disclosure practices makes it harder for consumers to make informed decisions about products to meet their needs.

Information asymmetry arises if one party in an economic transaction has more or better information than the other party. In insurance, information asymmetries can hinder the insured's decision-making because of their lack of understanding about premium pricing, policy coverage and personal risk.[10] This in turn can lead to poor consumer outcomes in the form of inflated premiums, underinsurance, or coverage that is inappropriate for their needs and/or disputes in the event of a claim.

There are practical difficulties for every consumer to fully grasp all the details about an insurance product. As such, insurers have a responsibility to help customers make good financial decisions. In the context of pricing, this can be supported by the following considerations:

[9] For example, the insured must reveal all information relevant to the risk being insured that is known to them, and the insurer is legally allowed to rely on that information as being complete and accurate. Under ordinary commercial contracts, the principle of utmost good faith does not apply, and instead the key principle is buyer beware.

[10] Senate Economic Reference Committee (2017) page 27

- **Information to support understanding of product design and suitability**: accessibility and understandability should be considered as part of product design such that any complexities introduced into a product or its distribution process appropriately consider the target customers' ability to understand and obtain coverages that are most suitable to their needs. In some cases, simplifying product design can help improve accessibility and understandability of the product for customers.
- **Plain language communication**: to enhance the transparency around pricing, it is important to communicate to consumers in plain language to avoid inadvertent underinsurance, lack of understanding of the product purchased and purchase of an insurance cover which does not serve their purpose. A focus on the renewal notice as the commonly relied on source of information[11] requires disclosure of the previous year's premium to enable comparison and provide an adequate explanation of the change in premiums. This includes communication of key factors contributing to the price such as excess, sum insured and any changes in terms from the previous year. In addition to the renewal notice, explanations via digital channels and via insurance intermediaries need to be sufficiently considered.
- **Avoiding misleading conduct or representations**: promises made to customers about pricing and product coverages (including promises in relation to the handling of future claims) need to be delivered to customers in the manner promised. In Australia, both the Australian Securities and Investments Commission Act and the Competition and Consumer Act require that insurers must not engage in misleading or deceptive conduct or make false or misleading representations about the benefits or features of their products or services.
- **Access to information and explainability of outcomes**: customers should have the ability to review information used by an insurer in forming decisions that impact customer outcomes (such as pricing, underwriting and claims outcomes). Furthermore, insurers should be in a position to be able to explain the data and rationale used in determining outcomes impacting the customer. In certain circumstances, disclosure of this information should be proactive.

The discussion above focuses on the end customer, but it is equally applicable where there is an intermediary involved such as a financial adviser or broker. While the intermediary may have responsibility for the ultimate communication to the customer, the insurer has a responsibility to support the intermediary through the above considerations.

[11] Insurance Council of Australia (2017) page 34

CASE STUDY 1

Recent Consumer Protection issues in Australia

In October 2021, ASIC commenced civil penalty proceedings against a large Australian personal lines insurer, alleging that the insurer engaged in misleading or deceptive conduct and made false or misleading representations by failing to honour discount promises made to its consumers[12]. ASIC alleged the pricing algorithm caused promised discounts not to be fully passed on to customers without disclosure of this mechanism to customers.

In February 2023, ASIC commenced civil penalty proceedings against another major insurance brand alleging that it misled customers in its product disclosure statements about the pricing discounts available for certain types of insurance cover[13]. It was identified that certain discounts were not applied to additional premiums of optional extras because the pricing algorithm first calculated the discounts and then added additional premiums for optional extras. The pricing practice was inconsistent with disclosures made to customers that discounts would be applied to customers' insurance premiums.

In a 2023 report, AFCA found the policy definition was unclear for a pet insurance policy[14]. During the claims process, the insurer took various definitions provided in its policy together to give a restrictive interpretation to claims relating to pre-existing conditions. AFCA found the insurer's interpretation of the policy wording was unclear and that most people would not be able to understand the appropriate meaning of the policy definitions.

It is recognised in many such situations, insurers reported the matters to regulators upon discovery as per their compliance obligations and undertook steps to remediate the issues. These cases, nevertheless, demonstrate the importance of clear communication and transparency about pricing and policy coverage to customers.

2.2 Value for Money and Affordability

Value for money of insurance is whether the cost of the premium to take out the product is commensurate with the benefits provided to policyholders. This should be considered both when designing suitable insurance products and setting premium rates. These benefits[15], amongst others, can include:

- The expected value of direct claim payments to the insured.
- The viability of the insurer to pay claims, through both solvency and liquidity.
- Claim management processes that can save the insured cost and time. For example, the insured not needing to independently litigate a claim or directly manage the rebuild of an insured property.
- Other insurance services, such as the benefits provided to policyholders by insurance brokers, where these services are funded through insurance premiums.
- Utility and peace of mind to the policyholder from holding the insurance.

It is expected that such benefits should form a considerable proportion of the premium being charged (accounting for a suitable time horizon to account for infrequent events), with the premium being considerably smaller than the maximum direct cost that the insured would otherwise bear (i.e., the coverage limit). In setting premiums, the insurer also needs to allow

[12] ASIC (2021)

[13] ASIC (2023a)

[14] AFCA (2023)

[15] Based on themes covered by Ward (2023)

for recovery of other costs that do not directly benefit the customer (for example upfront costs associated with establishing a policy) – these can be substantial and may require recovery over multiple years.

Insurance affordability refers to the extent to which an insurance premium for an appropriate coverage falls within the insured's capacity to pay. Low affordability may lead to a need to prioritise premium payment over other expenses or, in severe cases, financial hardship for the insured. This capacity to pay is affected by the level and scope of cover required for each potential policyholder, the cost of the premium for a given cover relative to the policyholder's income or wealth, as well as how effectively the premium can be budgeted for. When insurance becomes unaffordable, the cost of otherwise insured risks becomes implicitly self insured. While self insurance may better reflect the risk appetite for some policyholders, it is unlikely to be the case for many policyholders – therefore is an imperfect substitute for the protection provided by insurance.

In some cases, affordability can conflict with a principle to set premiums that are commensurate with the individual risk. This often manifests in the use of cross-subsidy as a mechanism to improve affordability for a small subset of customers at the expense of slightly reduced value for money for others. An extreme example of this has been in areas that are prone to regular flooding – as setting premiums based on the risk can lead to premiums in the tens of thousands of dollars. Any reduction of premium to address this may lead to higher consumer take up and, for an insurer, an overweight exposure towards that loss leading segment, which may be unsustainable in the longer term. Insurance premiums are also an important risk signal to customers and communities and can act as disincentives to rebuild or build new properties in high hazard areas when fully reflective of the individual risk. These considerations are complex and difficult for pricing teams alone to navigate and require government and community consultation. In practice, the role of a pricing team can be to provide information that helps inform company strategies and public policy decisions, including around building codes, land use and planning.

Notably in more highly regulated classes of insurance which fulfill an important community need (such as for compulsory insurance), an affordability requirement and the corresponding cross-subsidy may be embedded into the level or structure of premiums, with a potential option for governance of this occurring by regulatory approval for premium rates to be set. Compulsory Third Party (CTP) insurance for motor vehicle injuries often has an objective of being affordable and requires a particular pricing structure. For example, the New South Wales (NSW) CTP scheme has key objectives of ensuring sustainability of the privately underwritten scheme and keeping premiums affordable through reasonable levels of profits and partial community rating. Accordingly, regulation of premiums includes detailed limits on premium variation across region and vehicle class, excluded risk factors (e.g., policy duration and postcode) as well as a Risk Equalisation Mechanism[16] designed to limit excess profits or losses[17].

Likewise, the immediate cost of insurance premiums can prohibit the maintenance of ongoing cover for individual policyholders, even when the insurance offers value for money. This may be due to policyholders having a low disposable income, or the cost of insurance exceeding the amount previously budgeted for. Although the individual circumstances of every policyholder are unlikely to be known by insurers, considering the circumstances of those representing the typical profile of customers as well as that of the smaller groups of atypical

[16] Risk equalisation mechanisms are designed to balance the premium income and claim risk exposure of an insurer. In the NSW CTP scheme, this may involve reallocating high risk or low risk policies, premiums collected or the claim costs among participating insurers (*Motor Accident Injuries Act 2017* (NSW), s. 2.24).

[17] SIRA (2023)

customers in the fringes can assist in improving insurance affordability[18]. Pricing strategies that may be considered in this could include:

- Minimising any cross-subsidisation of non-vulnerable groups by vulnerable groups,
- Setting suitable premium change constraints for individual policies to mitigate bill shock on renewal,
- Preferencing smooth models that limit the prevalence of 'cliffs'[19] (or escarpments) in premium loadings for individual rating factors, and
- Ensuring pricing results from impact analysis are transparent and explainable.

It is recognised that it may not be possible to make premiums affordable in all situations due to the nature of particular risks.

In many situations, pricing is not the only lever available for insurers to improve the value for money and affordability of insurance. In setting premium rates, product design and risk mitigation efforts that can enhance value for money and/or affordability may also be accounted for. For certain products such as life Insurance, long term contracts could mean that price may be the main lever for historical products, as other changes require an active choice by the customer and potentially require financial advice.

[18] One such approach to assessing premium impacts on policyholders is proposed in Paddam, Liu and Philip (2023).

[19] Premium loading cliffs exist where typical changes in policy information year-to-year result in significant changes in premium loadings. Such factors may include the driver getting one year older, or the building sum insured being indexed automatically.

CASE STUDY 2

Affordability of property insurance coverage in northern Australia

Property insurance in northern Australia has been identified as being unaffordable for some communities[20]. This stemmed from the exposure of these areas to natural perils and property vulnerability, and the associated costs insurers incurred to offer coverage for this – including claims payments, maintaining adequate reinsurance, and managing post-event claims management processes. As insurers sought to align premiums with the risk at individual address levels in recent years, these costs were increasingly borne by individual insureds, rather than at a postcode or region-level in the past[21].

The Commonwealth Government's response was to establish a Cyclone Reinsurance Pool (CRP) administered by the Australian Reinsurance Pool Corporation (ARPC) with a phased introduction from 1 July 2022[22]. The CRP covers cyclone and related flood damage for household, strata and small business property insurance policies with participation being mandatory for general insurers above a certain size with eligible policies.

The CRP is intended to lower the reinsurance cost for policies with medium to high exposure to cyclone risk with minimal impact on policy premiums for lower cyclone-risk properties. By ceding eligible cyclone risks to the CRP, insurers would not encounter the capital costs of these cyclone risks and therefore removes the need to charge margins on corresponding cyclone premiums. The pricing of the CRP premiums includes cross-subsidisation of reinsurance costs from low cyclone exposed risks to medium to high cyclone exposed risks. In a report commissioned by the ARPC, such a scheme is expected to reduce premiums by 15-19% in northern Australia, and by 18-38% in high cyclone premium bands in these regions[23].

The Government has tasked the Australian Competition and Consumer Commission (ACCC) with monitoring the impact of the pool for the first five years of its operation. ACCC notes that it is early days for benefits of the CRP to flow through to most customers as insurers only began to join the CRP recently[24].

There has been some community discussion about whether the CRP be extended to cover flood. A report commissioned by the Actuaries Institute report concludes that "a flood pool with the same structure and funding design as the Cyclone Pool would not be viable or sustainable to address the flood premium affordability challenge"[25].

This case demonstrates the challenges in making certain risks affordable and application of cross-subsidies between different groups of customers.

[20] ACCC (2020)

[21] ACCC (2020)

[22] Australian Reinsurance Pool Corporation (2022)

[23] Finity (2022)

[24] ACCC (2023)

[25] Chow et al. (2023)

CASE STUDY 3

Value for money of group life insurance

Group life insurance provides basic and affordable life insurance cover for many Australians. This cover is typically bundled with superannuation products, but is also available outside of such arrangements. Typically, default cover is provided to eligible members without the need for additional underwriting or any lengthy application process.

This structure has numerous pros and cons. It efficiently provides a wide range of members with access to basic insurance cover at relatively low cost. However, the inherent default product design means that cover may not be good value for money to some groups of members, or may over- or under-insure some members.

There has been significant government and regulator scrutiny of group life insurance in recent years; some key findings and outcomes include:

- In 2019, ASIC highlighted poor consumer outcomes in Total and Permanent Disability (TPD) insurance associated with the use of a relatively strict Activities of Daily Living (ADL) definition for specific groups of members, limiting TPD claims to extreme cases of disability only.[26] Since then, many insurers have updated their claim definitions in response, with appropriate pricing changes.
- ASIC subsequently probed the value for money of default insurance in superannuation, finding that while a high proportion of premiums are expected to be paid in claims on average, some groups of members may be receiving relatively low value for money (e.g., younger members, or those less suited by the default insurance product design).[27]
- The legislative changes *Protecting Your Superannuation Package*[28] and *Putting Members' Interests First*[29] removed default insurance from a significant number of superannuation accounts for members, many of whom were susceptible to poor value for money.

The above scrutiny followed earlier findings of poor value for money for other specific life insurance products – such as "add-on" directly marketed insurance and funeral insurance. In these instances, while the fundamental purpose of the insurance may have been valid, the way in which it was sold or priced in certain circumstances provided poor customer outcomes.[30]

[26] See ASIC (2019) – Report 633 Holes in the Safety Net.

[27] See ASIC (2020) – Report 675 Default Insurance in Superannuation.

[28] See Parliament of Australia (2019) – Protecting your Superannuation Package

[29] See Parliament of Australia (2020) – Putting Members' Interests First

[30] See Hayne (2019) – Royal Commission into Misconduct in the Banking, Superannuation and Financial Services Industry Final Report.

2.3 Anti-Discrimination and Fairness

Fairness Goals

There is no simple and universally agreed definition of fairness, but one perspective is that fairness is about actions, harms, representation, and vulnerability. One could say that fairness is when one's actions do not disproportionately harm vulnerable groups or individuals. Using this perspective, fairness can be improved by identifying the vulnerable and reducing their share of negative outcomes.

Fairness principles should be considered when insurers set premiums and underwriting acceptance rules. Insurers can make their fairness goals more practical by expressing them as tangible target outcomes, such as:

- delivering premiums for customers that are commensurate to the risks that they are transferring to their insurer,
- providing adequate coverage to all insurable applicants regardless of their attributes (or alternatively restricting cover for some applicants, to retain affordable pricing for other applicants), and
- defining and then applying an appropriate level of cross-subsidies.

Fairness can mean different things to different people. For example, someone living in a high flood risk zone (often due to socio-economic reasons, e.g., they can't afford to live elsewhere) might think it fair to spread the risk across the whole population to keep their premiums more affordable. On the other hand, someone living in a zero-risk flood area may think it unfair to pay any contribution to those choosing to live in flood zones, and demand that pricing be risk-based. Clearly, both cannot be satisfied simultaneously.

Conflicts in definitions of fairness usually make it impossible to meet the demands of all stakeholders, and compromises are required. This requires community and political discourse and potential regulations around specific types of insurance needs (such as for CTP and cyclone and cylone related flood as already discussed). A key role of insurers and insurance pricing teams is to ensure that any debate around solutions is well informed by analysis and data. In the absence of a clear decision by the broader society of the appropriate trade-off position, pricing teams should consider what a reasonable option might be. If clear direction is provided by broader society (for example, in the form of regulation that restricts price setting in some manner), pricing teams should (or potentially must) act in accordance with that direction.

While cross-subsidies (or non-risk-based pricing) may sometimes be good, other times they entrench what broader society considers an unfair bias. For example, when insurers use price elasticity modelling to vary profit margins between customers, they may adversely impact vulnerable groups e.g., older people. Some jurisdictions have restricted the use of pricing based on demand modelling or non-risk-based price variation[31].

Quantifying Fairness

In recent years, many fairness criteria and metrics have been suggested in machine learning research. These criteria apply beyond machine learning, to all algorithmic decisions including pricing and underwriting. Examples include both group fairness criteria (such as demographic parity and conditional demographic parity) and individual fairness criteria (such as fairness through unawareness, fairness through awareness, and counterfactual fairness), see Xin and Huang (2023) for detailed discussions on applying them for insurance pricing. However, it is important to understand that satisfying all these criteria with a single algorithm is nearly

[31] See FCA (2021b) for restrictions introduced in the UK on pricing of renewal premiums which must not be higher than equivalent new business premiums for some products; and NAIC CAS Task Force (2015) for restrictions introduced in the US insurance market on pricing based on non-risk factors or practices known as 'pricing optimisation'.

impossible unless strict conditions are satisfied. Different fairness criteria often lead to different pricing results.

Vulnerability

In practical ethics, insurers must decide whom to prioritise for protection[32]. One approach is to assess the vulnerability of different stakeholders. Vulnerability depends on factors like power and the extent of harm (either pre-existing, or the threat of prospective harms). Ethical pricing and underwriting should safeguard those who are powerless, disadvantaged, and have limited bargaining power. This includes people who lack access to information and options due to language barriers, low disposable income or access to other resources. It also involves individuals facing entrenched disadvantage and those who do not have the means to protect themselves. Pricing and underwriting decisions should also consider the impact of choices on certain groups of people who are potentially vulnerable, who may experience greater harm or find it harder to avoid or reduce potential harms.

Definitions of Discrimination

Discrimination comes in two main forms: direct and indirect[33]. Direct discrimination happens when someone is treated unfairly because of a protected characteristic they possess. This can be avoided if insurers do not use these characteristics as risk factors. Indirect discrimination is defined by laws in different places, for example, see the definition in European Union's Directive 2004/113/EC ("Gender Directive")[34] and the Australian Human Rights Commission's definition[35]. There are many discrimination laws, with some of the major laws in Australia listed in Appendix A. The legal environment relating to discrimination continues to evolve, so it is incumbent on pricing practitioners to stay abreast of the latest laws in their jurisdiction(s) and how they affect insurance pricing. A useful guide to discrimination in insurance pricing and underwriting was published by the Australian Human Rights Commission in December 2022, and on which the Actuaries Institute was its partner[36].

Indirect discrimination occurs when a seemingly neutral practice or rule negatively affects certain individuals with protected characteristics more than others. Common examples include using postcodes, credit information, education level or occupation as proxies of protected attributes (such as age, disability, race or gender). To prevent both direct and indirect discrimination, insurers should regularly review their insurance processes and products.

[32] Sanderson, Douglas and Lu (2023)

[33] Frees and Huang (2023)

[34] Council of the European Union (2004)

[35] Australian Human Rights Commission (n.d.b)

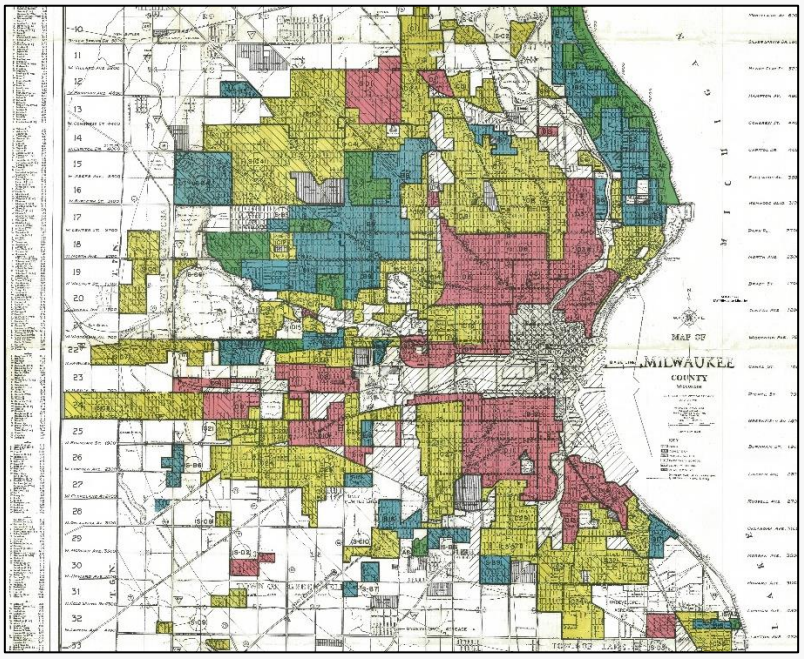
[36] Australian Human Rights Commission (2022)

CASE STUDY 4

Redlining in the USA

The concept of 'redlining' describes the historical practice in USA that originally began as a means of discouraging credit and home loans to residents of certain neighbourhoods. These neighbourhoods tended to be predominantly black and Hispanic communities. The practice of redlining also eventually extended to insurance.

Example of Redlining – Map of Milwaukee, Wisconsin, USA created by the Federal Home Loan Bank and the Home Owners' Loan Corporation in 1938 as a guide for mortgage lenders to graphically reflect the desirability of investing in neighborhoods[37]



While laws have been introduced in the USA since the 1960s to prevent discrimination based on race, Iturria (2023) observes that communities in the disadvantaged zones continue to face higher insurance premiums today. They suggest that indirect discrimination against minority racial groups may still exist based on certain simulations and modelling assumptions.

This case presents a historic example of unfair discrimination. For a comprehensive discussion on discrimination in insurance pricing and examples of direct and indirect forms of discrimination see Frees and Huang (2023).

[37] Sourced from Iturria (2023) with author crediting the image from U.S. Federal Home Loan Bank (1938).

CASE STUDY 5

Mental health coverage in insurance

Mental illness prevalence has expanded in the last decade, driven at least in part by wider acceptance and understanding of conditions. More than half the population are expected to experience a mental health disorder during their lifetime[38]. This trend has resulted in a material increase in claims under certain types of insurance policies.

In this context, there is a tension between insurer risk management and fairness, with many concerns expressed on behalf of consumers with a history of mental illness regarding their interactions with the insurance industry. A key concern is that the design and pricing of insurance cover, along with underwriting and claims management practices, can provide a disincentive to seek diagnosis and treatment of mental illness or unreasonably restrict access to insurance.

There are also a number of considerations that have been identified through recent research and reporting[39], which can be used to improve fairness and reduce discrimination in relation to mental health:

- Underwriting acceptance – avoidance of blanket mental health exclusions or unreasonably high premium loadings
- Claim acceptance – ensuring that pre-existing mental health conditions have a direct medical connection to claim if used as a means for declining a claim
- Supporting data – regularly reviewing the data relied on to make decisions to discriminate on the basis of mental health and continually seeking better data to enable differentiated underwriting of particular mental health conditions to facilitate insurance being as accessible as is reasonable
- Ensuring affordability of cover – design and pricing changes to ensure continued affordability of cover (e.g., tapering or cessation of benefits, additional underwriting to obtain cover, appropriate treatment and recovery plans, etc.), including consideration of the generosity of customer benefits.

The above requires balancing of aspects that may improve customer outcomes, with the possibility of increased cost and therefore reduction in affordability of cover for some policyholders. For instance, retail life insurance contracts are long-term with product design elements that are unable to be changed, which means the evolving mental health landscape can be difficult to manage without implications for cost and affordability. Both the Life Insurance and General Insurance Codes of Practice[40] include a number of aspects that seek to address some of the above fairness and discrimination considerations.

This case is an example of a contemporary issue relating to discrimination and fairness that insurers are presently navigating.

[38] University of Queensland (2023)

[39] Public Interest Advocacy Centre (2021), Actuaries Institute (2023b), National Mental Health Commission (2023)

[40] CALI (2023), Insurance Council of Australia (2021) noting this Code is currently under independent review as announced in Insurance Council of Australia (2023).

Mitigating Discrimination

To address discrimination, there are three main approaches: pre-processing, in-processing and post-processing[41]. Pre-processing involves removing discriminatory information from historical data, or reweighting historical data to rebalance outcomes across groups, before applying standard machine learning techniques for modelling. In-processing techniques modify learning algorithms during the model training phase to eliminate discrimination[42]. Post-processing adjusts a trained model to reduce discrimination[43]. For practical guidance on how to address algorithmic bias, there is a Technical Paper written by the Australian Human Rights Commission in 2020[44].

2.4 Responsible and Appropriate Use of Data[45]

Insurance companies collect personal information from customers which may include sensitive information such as health and medical records. Data should be sourced and used in a manner that actively considers what people would reasonably expect. At a minimum this requires compliance with privacy and related laws, although there may be situations where reasonable customer expectations exceed such standards and this should also be considered. This may require a professional to contemplate data accuracy, completeness, consistency, validity (the intuitive relationship of data to the decision process itself), integrity (including the ability to edit or modify data), timeliness, storage, destruction, security, and considerations of ownership, power or intellectual property. Where data is obtained from a third-party source, consideration should be given to whether to display this back to the customer and allow them to validate or correct if the information is inaccurate, particularly in situations where the insurer cannot be certain of the accuracy of the data.

Pricing processes may also generate new data (for example, a record of decisions made by a customer), which should be stored and used in a responsible and appropriate manner.

[41] Note that many of the mitigation methods require the information of protected variables of policyholders, which may not be collected by insurers (such as race and ethnicity). In this case, statistical approaches to imputing the protected attributes may be used to assess and mitigate indirect discrimination.

[42] For example, using adversarial learning to ensure fairness Grari et al. (2022).

[43] For example, see Pope and Sydnor (2011) and Lindholm et al (2022).

[44] Australian Human Rights Commission (2020)

[45] Content in this section is based on Actuaries Institute (2020b) used with permission from the Actuaries Institute.

CASE STUDY 6

Privacy Implications of Leveraging Social Media Data for Insurance Pricing: A Case Study from the UK

In 2016, the UK-based car insurer Admiral attempted to introduce a product called 'firstcarquote', which aimed to utilise customers' Facebook data in order to determine insurance premiums. Through algorithmic analysis, this product would assess customers' posts and likes to evaluate their level of risk. According to Admiral's website on the day of launch, they aimed to "[create] a reputational track record in the absence of a driving history or no claims bonus"[46]. For example, Facebook entries containing frequent invitations to meet up with friends, specifying times, dates and locations, suggested an organised individual who was considered less risky as a driver.

Despite claims from Admiral that no customers would be provided with a more expensive quote (only offering discounts of between 5% and 15%), widespread condemnation and community backlash followed. Jim Killock, the Executive Director of Open Rights Group, an organisation advocating for the preservation of digital rights and freedoms, criticised the product for its potential to perpetuate "social biases that are based on race, gender, religion or sexuality[47]". Facebook also criticised the proposed product, stating that it violated its privacy rules and citing Section 3.15 of its platform policy, which prohibits the use of site data to "make decisions about eligibility, including whether to approve or reject an application or how much interest to charge on a loan"[48].

Eventually, firstcarquote was launched with reduced functionality, allowing users to link their Facebook account to the insurer but removing the ability to analyse the data.

This case illustrates the risks of using new data sources enabled by technology and privacy expectations of the community. For further discussion on this theme, see Actuaries Institute paper 'Big data and the digital economy'.[49]

2.5 Avoiding Perverse Incentives

Insurance pricing and underwriting practices should minimise perverse incentives. For example, they should not reward risk-seeking behaviour, environmental damage, or other negative externalities.

[46] Peachey (2016)

[47] Killock (2016)

[48] Ruddick (2016)

[49] Grace (2022)

CASE STUDY 7

Navigating contemporary issues – genetic testing and decarbonisation

Genetic testing

Genetic testing allows people to identify risk of certain diseases or mutations and, as testing becomes cheaper, has the potential for improving health outcomes for people from early management of future health risks. At the same time, it can also provide further insight to insurance companies to assess a customer's risks.

Given genetic health risks are outside the control of an individual, the potential for people to be discriminated against based on their genetic testing results might be regarded as unfair. Additionally, as a result of this, some customers may avoid undertaking testing due to fear of potential discrimination by insurance companies.

To avoid such perverse incentives, many countries are placing restrictions on how insurers may use results of genetic testing during underwriting. For example, in Australia, under the Council of Australian Life Insurer's (CALI's) Moratorium on Genetic Tests in Life Insurance[50], customers cannot be compelled to take a genetic test at any time. When underwriting new policies for cover that is below industry-set limits, an insurer cannot use existing genetic test results (unless a customer chooses to disclose the results). Above these limits, existing results can be requested and used if relevant to the new cover.

However, a recently released report, partially funded by the Australian Government, has recommended that insurers be prohibited from using genetic or genomic test results in pricing life insurance – in order to avoid deterring people from having genetic testing that may potentially improve health outcomes.[51] In this scenario, consideration also needs to be given to the potential for customers to purchase or increase cover levels following an adverse genetic test result, particularly as testing technologies develop improved predictive capability. This may impact the cost of insurance to all customers. The Australian Government has issued a consultation paper on legislative intervention options for the use of genetic testing results in life insurance underwriting[52], with responses from across both the insurance and medical industries generally supportive of further review.

Decarbonisation

The societal impacts of climate-related disasters are being felt around the world with extreme weather events headlining frequently. In Australia, the Insurance Council of Australia estimates the costs of extreme weather events are expected to reach $35 billion a year by 2050[53].

Globally, insurance and reinsurance companies are responding to the challenge of climate risks and reviewing what role they play in reducing carbon footprints from their business. Many large insurance and reinsurance brands have publicly declared their intention to phase out insurance coverage to carbon intensive industries such as coal, oil and gas over time[54].

[50] See Moratorium on Genetic Tests in Life Insurance in CALI (2023).

[51] See Tiller et al. (2023) - A-GLIMMER Final Stakeholder Report.

[52] The Treasury (2023).

[53] Insurance Council of Australia (2022).

[54] For more detail on response from different insurance and reinsurance companies, see Insure Our Future (2023).

Insurance and reinsurance companies play an important role in the financial system and are attempting to prevent perverse incentives that some of their carbon intensive customers may face. Some industries face a trade-off between short-term financial gains and the long-term environmental costs associated with their activities. To mitigate long-term environmental risks, many insurance and reinsurance companies are responding through incentives for customers that adopt sustainable technologies and business practices while discouraging environmentally detrimental practices through pricing and underwriting criteria. However, this activity has become politically contentious in some jurisdictions, and society's expectations of insurers on this topic is likely to become clearer over the short to medium term.

We note also that insurers and reinsurers are engaging with various global initiatives such as the International Sustainability Standards Board, UN Principles for Responsible Investing, UN Sustainable Development Goals, as well as related domestic initiatives including under Australian Sustainbility Reporting Standards.

2.6 Sustainability

Sustainability, in a non-environmental sense, has received considerable exposure in recent years, particularly within the life insurance industry in Australia. While customer contracts are typically longer term in life insurance, the approach and key considerations remain applicable across the entire insurance industry. Sustainability covers a wide range of product lifecycle considerations, including a number that are covered in other sections of this paper.

Sustainability is a concept applicable holistically across a product or portfolio; pricing is only one of many levers available to manage sustainability. A guide developed by the Actuaries Institute Disability Insurance Taskforce[55] in 2022 contains a definition of sustainability. Key sustainability outcomes in relation pricing include:

- Stable and predictable pricing over time (including across different ages)
- Pricing that is understood by customers
- Meeting policyholder reasonable expectations initially and over time, including supporting confidence within the community about the value and fairness of life insurance products
- Consistency of pricing with underlying risks
- Financial outcomes that allow insurers to continue to provide cover to the market and pay claims (including appropriate return for underlying risks and adequate return on capital)
- Management of riskier product design features, including through appropriate pricing
- Appropriate customer communication through disclosures and illustrations to help customers understand how premiums may change over the life of a policy
- Management of customer responses to changes in pricing – for example, the possible selective lapsation impacts of premium rate increases.

Some examples of how industry practices can present sustainability challenges are:

- Significant upfront premium discounts that unwind over time are applicable to some life and general insurance products: While the effect of underwriting may mean such discounts are reflective of the underlying claims risk, as the discount unwinds, customers are likely to be able to find a new policy that has similar benefits at a cheaper premium. This can contribute to higher policy lapses or "churn" that can ultimately increase the general level of premiums over time across the industry.[56]

[55] Disability Insurance Taskforce of the Actuaries Institute (2022)

[56] See FCA (2020) for an example from the UK general insurance market.

- "Level premium" life insurance products are designed to remain affordable for customers over the long-term: They involve charging a higher premium rate in the earlier years of the policy, but continuing to charge premiums based on customer's age at entry, rather than automatically increasing with age. While the pricing is generally not guaranteed, the ability to increase premium rates at a later time needs to be considered in light of how such policies are marketed to customers.
- Individual Disability Income Insurance: While the sustainability issues in this line of business were largely driven by product design, there were a number of shortcomings in pricing practices that contributed, as discussed in the next case study.
- Legacy products, systems and processes that hinder product development, best practice pricing or do not provide consumers with a product that meets their needs: This has previously been referenced by the Actuaries Institute.[57]

CASE STUDY 8

Australian Disability Income Insurance

During 2014 to 2020, the life insurance industry lost c. $4 billion on individual disability income insurance (IDII)[58], despite significant increases to customer premiums. The Australian Prudential Regulator's (APRA's) concern regarding the threat to insurer sustainability and customer outcomes led to its unprecedented intervention in this market to mandate elements of product design and impose additional capital requirements on insurers. The release of these capital requirements is now tied to the ability of life insurers to demonstrate responsible market practice and uplift in areas of governance, risk management, pricing and product design, and data management.

Elements of pricing practice that were considered to have contributed to the severity of the situation include:

- Failure to properly account for a range of sources of uncertainty in assumption setting and pricing (including adverse experience or volatility caused by product design and trends arising from customer behaviour and social factors impacting on claims cost), including failure to respond in a timely manner to adverse trends.
- Lacking a granular understanding of the product's cost drivers, across all benefit options and features, including the guaranteed renewable nature of policies, and/or failure to reflect these in product pricing.
- Prioritising new business sales/market share over long-term sustainability and future premium stability.

This case presents an example of deteriorating financial sustainability, consequent impacts and learnings.

[57] See Actuaries Institute (2023a) Pre-Budget Submission, "Life Insurance Product Rationalisation".

[58] APRA (2023) Quarterly Life Insurance Performance Statistics

3 Conclusions

This paper has been prepared to support professionals working in insurance, including actuaries, with responsibilities for and oversight of pricing-related functions. It discusses six principles, which professionals are encouraged to consider during a pricing process. It is noted that these principles are not intended to be the definitive list, although it is important that each business has a set of principles that are well articulated, understood, applied and monitored to ensure strong governance. Each business situation is unique, and professionals should continue to use their best judgment regarding the relevance of the principles presented in this paper to their situation and the extent to which other factors exist.

There are often tensions and trade-offs between different principles. For example, a sustainable price for an insurance product may not necessarily be affordable in all situations. Such challenges are not new – as far back as 1980, Jewell[59] notes trade-offs between accurate risk classification and goals of society such as anti-discrimination. Furthermore, there may be conflicting stakeholder interests and/or established organisational or industry practices which may present hurdles to a constructive solution.

In such complex situations, good practice involves analysing and evaluating the vulnerability, potential harms, and beneficial interests of each stakeholder. Pricing practitioners should also refer to any existing frameworks that may exist in their organisations and may find it helpful to seek advice and perspectives from a diverse range of experts, such as consumer groups, risk professionals and legal advisers.

Consideration should be given to how judgements and trade-offs should be clearly documented and communicated to appropriate individuals, particularly those in decision making or responsible roles.

[59] Jewell (1980)

4 References

ACCC (2020). *Northern Australia Insurance Inquiry* [Final Report]. https://www.accc.gov.au/system/files/Northern%20Australia%20Insurance%20Inquiry%20-%20Final%20Report%20-%2030%20November%202020.pdf.

ACCC (2023). *Insurance Monitoring*. https://www.accc.gov.au/system/files/accc-insurance-monitoring-report-december-2023.pdf.

Actuaries Institute (2020a). *Code of Conduct.* https://actuaries.asn.au/Library/Council/2020/CCMar2020.pdf

Actuaries Institute (2020b). *Technical Paper: Automated Decision-Making Systems*. https://www.actuaries.asn.au/Library/Miscellaneous/2023/TPAUTODECOCT2020.pdf

Actuaries Institute (2023a). *Pre-Budget Submission (2023/24)*. https://actuaries.asn.au/Library/Submissions/2023/PREBUDGETSUBMISSION.pdf

Actuaries Institute (2023b). *Consultation: Draft National Stigma and Discrimination Reduction Strategy*. https://www.actuaries.asn.au/Library/Submissions/2023/230131SUBMENTALHEALTH.pdf

AFCA (2023). *Systemic issues insights report: quarters 1 and 2 financial year 2022-23 Edition 2*. https://www.afca.org.au/about-afca/systemic-issues/reports

APRA (2022). *Premium increases in the life insurance industry. Joint APRA and ASIC letter to CEOs of life companies*. https://www.apra.gov.au/premium-increases-life-insurance-industry

APRA (2023). *Quarterly life insurance performance statistics March 2023* https://www.apra.gov.au/sites/default/files/2023-05/Quarterly Life Insurance Performance Statistics March 2023.xlsx

ASIC (2019). *REP 633 Holes in the safety net: A review of TPD insurance claims*. https://asic.gov.au/regulatory-resources/find-a-document/reports/rep-633-holes-in-the-safety-net-a-review-of-tpd-insurance-claims/

ASIC (2020). *REP 675 Default insurance in superannuation: Member value for money*. https://asic.gov.au/regulatory-resources/find-a-document/reports/rep-675-default-insurance-in-superannuation-member-value-for-money/

ASIC (2021). *21-270MR ASIC launches Federal Court action and calls on general insurers to review pricing practices* [Media Release]. https://asic.gov.au/about-asic/news-centre/find-a-media-release/2021-releases/21-270mr-asic-launches-federal-court-action-and-calls-on-general-insurers-to-review-pricing-practices/

ASIC (2023a). *23-038MR ASIC sues RACQ over alleged pricing discount failures, urges industry to improve pricing practices* [Media Release]. https://asic.gov.au/about-asic/news-centre/find-a-media-release/2023-releases/23-038mr-asic-sues-racq-over-alleged-pricing-discount-failures-urges-industry-to-improve-pricing-practices/

ASIC (2023b). *REP 765 When the price is not right: Making good on insurance pricing promises*. https://download.asic.gov.au/media/lnxpj0uu/rep765-published-23-june-2023.pdf

ASIC Regulatory Guide 175 (2021). *Licensing: Financial product advisers-Conduct and disclosure*. https://download.asic.gov.au/media/lwymamxz/rg175-published-15-june-2021-22020915.pdf

ASIC Regulatory Guide 274 (2020). *Product design and distribution obligations*. https://download.asic.gov.au/media/dlpccdof/rg274-published-11-december-2020-

20220628.pdfCorporations Act, 961B (2001). http://www5.austlii.edu.au/au/legis/cth/consol_act/ca2001172/s961b.html

Australian Human Rights Commission (2020). *Technical paper: Addressing the problem of algorithmic bias*. https://humanrights.gov.au/our-work/technology-and-human-rights/publications/technical-paper-addressing-algorithmic-bias

Australian Human Rights Commission (2022). *Guidance Resource: Artificial intelligence and discrimination in insurance pricing and underwriting*. https://humanrights.gov.au/sites/default/files/document/publication/ai_guidance_resource_december_2022.pdf

Australian Human Rights Commission (n.d.b). *Indirect discrimination*. https://humanrights.gov.au/quick-guide/12049

Australian Reinsurance Pool Corporation (2022). *The Cyclone Pool*. https://arpc.gov.au/reinsurance-pools/cyclone/. Accessed: 9-03-2024.

CALI (2023). *Life Insurance Code of Practice*. https://cali.org.au/life-code/

Chow, E., Barnes, D., Blunden, J., Davidson, J., Pang, E., Turvey, W., & Manton-Hall, J. (2023). *Funding for flood costs: Affordability, availability and public policy options*. Actuaries Institute. Sydney. https://www.actuaries.asn.au/Library/Opinion/2023/REPORTFLOODCOSTS.pdf

Council of the European Union (2004). *Council directive 2004/113/EC of 13 December 2004 implementing the principle of equal treatment between men and women in the access to and supply of goods and services*. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32004L0113.

Disability Insurance Taskforce of the Actuaries Institute (2022). *Individual Disability Income Insurance Sustainability Guide*. https://www.actuaries.asn.au/Library/Miscellaneous/2022/DITFSGDEC22.pdf

FCA (2020). *MS18/1.3: General insurance pricing practices Final Report*. https://www.fca.org.uk/publication/market-studies/ms18-1-3.pdf

FCA (2021a). *FCA fines LBGI £90 million for failures in communications for home insurance renewals between 2009 and 2017* [Media Release]. https://www.fca.org.uk/news/press-releases/fca-fines-lbgi-90-million-failures-communications-home-insurance-renewals-2009-2017

FCA (2021b). PS21/5: *General insurance pricing practices market study* https://www.fca.org.uk/publication/policy/ps21-5.pdf

FCA (2022). PS22/9: *A new Consumer Duty*. https://www.fca.org.uk/publications/policy-statements/ps22-9-new-consumer-duty

Finity (2022). Cyclone Reinsurance Pool – Summary of the Actuarial Premium Rate Assessment. https://arpc.gov.au/wp-content/uploads/2022/10/2022.07.08-Publication-ARPC-CRP-Premium-Rate-Assessment-Report-reissued-8-July-2022.pdf

Frees, E.W. & Huang, F. (2023). The Discriminating (Pricing) Actuary, *North American Actuarial Journal*, 27:1, 2-24, DOI: 10.1080/10920277.2021.1951296

Grace, E. (2022). Big data and the digital economy: Benefits and pitfalls in the insurance industry. *Actuaries Institute*. Sydney. https://www.actuaries.asn.au/Library/Opinion/2022/ABSDataPaper.pdf

Grari, V., Arthur, C., Sylvain, L., & Marcin, D. (2022). A fair pricing model via adversarial learning. *arXiv* Preprint arXiv:2202.12008.

Hayne, K. M. (2019). *Royal Commission into Misconduct in the Banking, Superannuation and Financial Services Industry Final Report*, Volume 1, Commonwealth of Australia.

https://www.royalcommission.gov.au/system/files/2020-09/fsrc-volume-1-final-report.pdf

Insurance Council of Australia (2017), *Consumer Research on General Insurance Product Disclosures: Research findings report*. https://insurancecouncil.com.au/wp-content/uploads/resources/ICA%20reports/2017/2017_02_Effective%20Disclosure%20Research%20Report.pdf

Insurance Council of Australia (2021), *General Insurance Code of Practice*. https://insurancecouncil.com.au/wp-content/uploads/2021/10/ICA007_COP_Report_2021-Updates_2.1_LR.pdf

Insurance Council of Australia (2022). *Climate Change Roadmap Towards a Net-Zero and Resilient Future*. https://insurancecouncil.com.au/wp-content/uploads/2022/11/ICA-Climate-Change-Roadmap_NOV-1-FINAL.pdf

Insurance Council of Australia (2023). *Independent Review of the 2020 General Insurance Code of Practice* [Media Release]. https://insurancecouncil.com.au/wp-content/uploads/2023/12/Media-Release-Independent-Review-of-the-2020-General-Insurance-Code-of-Practice.pdf

Insure Our Future (2023). *Number of companies with fossil fuel exclusion policies, by sector*. Retrieved from https://global.insure-our-future.com/

Iturria, C.A.A (2023), *Discrimination in Insurance Pricing* [Doctoral thesis]. UWSpace. http://hdl.handle.net/10012/19264

Jewell, W.S. (1980). Models in Insurance: Paradigms, Puzzles, Communications and Revolutions, *21st International Congress of Actuaries*.

Killock, J. (2016). Facebook is Right to Sink Admiral's App. *Open Rights Group*. https://www.openrightsgroup.org/blog/facebook-is-right-to-sink-admirals-app/

Lindholm, M., Richman, R., Tsanakas, A., & Wüthrich, M. V. (2022). Discrimination-free insurance pricing. *ASTIN Bulletin: The Journal of the IAA*, 52 (1), 55–89.

Massey, R., Widdows, J., Bhattacharya, K., Shaw, R., Hart, D., Law, D. & Hawes, W. (2002), Insurance Company Failure. *Institute and Faculty of Actuaries Working Party*. https://www.actuaries.org.uk/system/files/documents/pdf/insurance-company-failure.pdf

Motor Accident Injuries Act 2017 (NSW). https://legislation.nsw.gov.au/view/whole/html/inforce/current/act-2017-010

NAIC CAS Task Force (2015). Casualty actuarial and statistical (c) task force price optimization white paper. https://content.naic.org/sites/default/files/inline-files/committees_c_catf_related_price_optimization_white_paper.pdf

National Mental Health Commission (2023). *National Stigma and Discrimination Reduction Strategy*. https://www.mentalhealthcommission.gov.au/projects/stigma-and-discrimination-reduction-strategy

Newton, D., Bland, R., Byrne, K., Clark, I., Cross, M., Fisher, S., Hinton, P., Leigh, J., Maguire, M. & Winter, R. (1999). General Insurance and The Public Interest, *GIRO Conference*. https://www.actuaries.org.uk/system/files/documents/pdf/gipubint.pdf

Paddam, S., Liu, C. & Philip, S. (2023). Home insurance affordability update. *Actuaries Institute*. Sydney. https://www.actuaries.asn.au/Library/Opinion/2023/UPDATEDHIUDPATE.pdf

Parliament of Australia (2019). Protecting Your Superannuation Package. https://www.aph.gov.au/Parliamentary_Business/Bills_LEGislation/Bills_Search_Results/Result?bId=r6141

Parliament of Australia (2020). Putting Members' Interests First. https://www.aph.gov.au/Parliamentary_Business/Bills_Legislation/bd/bd1920a/20bd032

Peachey, K. (2016). Facebook blocks Admiral's car insurance discount plan. *BBC*. https://www.bbc.com/news/business-37847647

Pope, D. G., & Sydnor, J. R. (2011). Implementing anti-discrimination policies in statistical profiling models. *American Economic Journal: Economic Policy*, 3 (3), 206–231.

Public Interest Advocacy Centre (2021). *Mental Health Discrimination in Insurance*. https://piac.asn.au/wp-content/uploads/2021/11/21.11.04-PIAC-Report_Mental-Health-Discrimination-Insurance.pdf

Ruddick, G. (2016). Facebook forces Admiral to pull plan to price car insurance based on posts. *The Guardian*. https://www.theguardian.com/money/2016/nov/02/facebook-admiral-car-insurance-privacy-data

Sanderson, C., Douglas, D., & Lu, Q. (2023). Implementing Responsible AI: Tensions and Trade-Offs Between Ethics Aspects. *arXiv*. http://arxiv.org/abs/2304.08275.

Senate Economic Reference Committee (2017), *Australia's general insurance industry: sapping consumers of the will to compare*. https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Economics/Generalinsurance/~/media/Committees/economics_ctte/Generalinsurance/report.pdf

SIRA (2023). *Motor Accident Guidelines.* https://www.sira.nsw.gov.au/resources-library/motor-accident-resources/publications/for-professionals/Motor-Accident-Guidelines.pdf

The Treasury (2023). *Use of genetic testing results in life insurance underwriting.* Consultation Paper. https://treasury.gov.au/sites/default/files/2023-11/c2023-467047_0.pdf

Tiller, J., Gleeson, P., McInerney-Leo, A.M., Keogh, L., Nowak, K., Barlow-Stewart, K., et al. (2023*). Final Stakeholder Report of the Australian Genetics and Life Insurance Moratorium: Monitoring the Effectiveness and Response (A-GLIMMER) Project*. Monash University. Report. https://doi.org/10.26180/23564538.v1

University of Queensland (2023). *Half the population to have a mental health disorder by 75* [Media Release]. https://www.uq.edu.au/news/article/2023/07/half-population-have-mental-health-disorder-75

U.S. Federal Home Loan Bank (1938). *Map of Milwaukee County, Wisconsin*. https://collections.lib.uwm.edu/digital/collection/agdm/id/3028/rec/1. Accessed: 24-01-2024.

Ward B. (2023). Consumer utility, capital and fair profit margins in insurance. *SSRN*. https://ssrn.com/abstract=4437638

Xi Xin & Fei Huang (2023) Antidiscrimination Insurance Pricing: Regulations, Fairness Criteria, and Models, *North American Actuarial Journal*, DOI: 10.1080/10920277.2023.2190528

Appendix A. Australian Regulations Relating to Insurance Pricing

Table below summarises some key Australian regulatory requirements and industry codes with respect to insurance pricing. The purpose of this section is to provide an overview of nature of regulations in place that impact the work of pricing professionals and how some of these regulations relate to the principles discussed in this paper.

The content in this section is not intended to be a comprehensive list of compliance requirements for insurance companies nor a technical interpretation of the laws. Laws specific to particular products or various states of Australia such as those relating to injury insurance schemes[60], anti-discrimination[61] and insurance taxes are not covered in this section.

Readers should rely on their own legal advice for compliance purposes.

Title	Overview	Relevant Sections	Implications to Insurance Pricing
Corporations Act 2001	Principal legislation regulating financial services entities in Australia, Act includes rules and regulations pertaining to licensing, disclosure, and supervisory authorities within the insurance industry.	Section 1041H – Misleading and Deceptive Conduct	Section 1041H states a person must not engage in conduct, in relation to a financial product or a financial service, that is misleading or deceptive or is likely to mislead or deceive.
		Part 7.8A – Design and Distribution Requirements Relating to Financial Products for Retail	Introduces obligations for insurers regulated via ASIC Regulatory Guidance 274 which, among other obligations, requires identification of the target market for a given product to assist customers in determining its appropriateness – influencing design and pricing of insurance products.
ASIC Act 2001	Main legislation outlining the responsibilities of the Australian Securities and Investments Commission (ASIC) to carry facilitative and supervisory roles.	Section 12DA – Misleading or Deceptive Conduct; and Section 12DB – False or Misleading Representations	Section 12DA states a person must not engage in conduct, in relation to financial services, that is misleading or deceptive or is likely to mislead or deceive. Section 12DB states a person in connection with the supply or possible supply of financial services must not make false or misleading representations.
Competition and Consumer Act 2010	The objective of the legislation is to promote competition and fair trading and provision for consumer protection.	Part IV – Restrictive trade practices	Part IV prohibits cartel conduct including price fixing between competitors.
Insurance Contracts Act 1984	Legislation seeking to strike a fair balance between the interests of insurers, insureds and	Section 13 – Utmost good faith	Section 13 requires that each party to a contract of insurance has a duty of utmost good faith to the other.

[60] NSW Motor Accident Injuries Act 2017 is presented in the table below as one example of a compulsory insurance scheme to showcase the nature of aspects relevant to pricing that may exist in such schemes.

[61] For detailed discussion on anti-discrimination laws in Australia including state and territories, refer to Australian Human Rights Commission (2022) chapter 3.

Title	Overview	Relevant Sections	Implications to Insurance Pricing
	other members of the public.		
General Insurance Code of Practice[62]	Code of practice developed by the industry in order to set out how insurers will meet their obligations to be honest, efficient, fair, transparent and timely in their dealings with customers.	Section 45 – Applying for or renewing insurance policies	Section 45 states if an insurer is assessing an application for insurance, then it can ask for and rely on information and documents only if they are relevant to the decision to insure and at what price and under what terms and conditions. This requires that the only questions that can be asked are those that are used in decision-making and prevents practices such as requiring customers to answer a question purely for data collection purposes.
		Section 50 – Premium Comparison	In the renewal notice, the insurer must give a comparison between this year and last year's premium and explain how it is calculated (home and domestic motor products only).
		Section 51 – No Claims Discount	If the insurance policy has a No Claims Discount, the insurer must explain how it works.
Life Insurance Code of Practice[63]	Code of practice developed by the industry in order to set benchmarks such that people can take out life insurance with confidence that, if the time comes, their life insurer will be there to support them.	Section 2 – Policy design, advertising and sales standards	Design should not include blanket exclusions for mental health. Products to be designed to meet the genuine need of consumers in the target market.
		Section 4 – Buying a Life Insurance Policy	Covers key aspects of underwriting that are and are not allowable, including types of information that can be requested in relation to mental health, family medical history and genetic testing.
Life Insurance Act 1995	Legislation in relation to the management of life insurance companies and the protection of policyowner interests.	Section 48 – Director duties	Includes a duty on directors to take reasonable care to see that, in the investment, administration and management of statutory fund assets, the life company gives priority to the interests of policyowners over those of shareholders.
Sex Discrimination Act 1984	Legislation to prohibit discrimination against people on the ground of sex, sexual orientation, gender identity, intersex status, marital or	Section 41 – Insurance	Requires that discrimination on the grounds of the client's sex in the terms of an insurance policy must be based on actuarial or statistical

[62] Insurance Council of Australia (2021), noting this Code is currently under independent review as announced in Insurance Council of Australia (2023).

[63] CALI (2023)

Title	Overview	Relevant Sections	Implications to Insurance Pricing
	relationship status, pregnancy or potential pregnancy, breastfeeding or family responsibilities.		data and must be reasonable having regard to the data. Pricing teams are required to ensure any pricing differential by sex is based on actuarial or statistical data and that the discrimination based on usage of the data is reasonable. Consideration should be given to what is reasonable usage.
Age Discrimination Act 2004	Legislation to prohibit discrimination against people on the grounds of age.	Section 37 – Superannuation, insurance and credit--actuarial data etc.	Provides that insurers may discriminate on the grounds of age if it is based upon actuarial or statistical data which it is reasonable to rely on and reasonable having regard to the matter of the data and other relevant factors or in a case where actuarial or statistical data is not available, reasonable having regard to any other relevant factors. Pricing teams are required to ensure any pricing differential by age is based on actuarial or statistical data and that the discrimination based on usage of the data is reasonable.
Racial Discrimination Act 1975	Legislation to eliminate all forms of racial discrimination.	All	Discrimination on the grounds of race is unlawful in insurance pricing in all forms. Consideration should be given to indirect discrimination that may occur.
Disability Discrimination Act 1992	Legislation to prohibit discrimination against people on the grounds of disability.	Section 46 – Superannuation and Insurance	Does not render it unlawful for an insurer to discriminate against a person, on the ground of the person's disability, by refusing to offer the person a life insurance policy or policy of insurance against accident or any other policy of insurance so long as the discrimination is based on actuarial or statistical data and that the discrimination based on usage of the data is reasonable.
New South Wales (NSW) Motor Accident Injuries Act 2017[64]	Legislation to oversee third party motor accident bodily injury insurance in the state of NSW.	Section 1.3 – Objects of Act	Describes objectives of the Act which include, among other things, the need to keep premiums affordable, sufficient but not excessive profits, sustainability and fair market practices.

[64] This Act is presented as one example of a compulsory insurance scheme to showcase the nature of aspects relevant to pricing that may exist in such schemes. There are various compulsory schemes across Australia – at both national and state levels – each with distinct features.

Title	Overview	Relevant Sections	Implications to Insurance Pricing
		Section 2 – Third Party Insurance	Covers various matters in relation to setting of premiums including ability for the regulatory authority to set guidelines for determining premiums, requirement for insurers to file premiums for approval, mechanisms for risk equalisation for balancing the profile of risks between insurers and mechanisms to deal with excess profits and losses.