

The Consumer Voice in Europe

## THE USE OF BIG DATA AND ARTIFICIAL INTELLIGENCE IN INSURANCE



**Contact:** Jasper De Meyer – [financialservices@beuc.eu](mailto:financialservices@beuc.eu)

**BUREAU EUROPÉEN DES UNIONS DE CONSOMMATEURS AISBL | DER EUROPÄISCHE VERBRAUCHERVERBAND**  
Rue d'Arlon 80, B-1040 Brussels • Tel. +32 (0)2 743 15 90 • [www.twitter.com/beuc](http://www.twitter.com/beuc) • [consumers@beuc.eu](mailto:consumers@beuc.eu) • [www.beuc.eu](http://www.beuc.eu)  
EC register for interest representatives: identification number 9505781573-45



Co-funded by the European Union

Ref: BEUC-X-2020-039 - 19/05/2020

## Why it matters to consumers

Insurance firms are increasingly relying on Big Data and artificial intelligence to personalise the offering of insurance products to consumers. While such evolutions come with potential benefits for users, including potentially better targeted insurance offers for certain segments of consumers, it equally raises concerns related to the protection of user data, privacy, fairness, and financial exclusion. New consumer safeguards are needed to ensure that innovative uses of consumer data are consumer-friendly.

## Summary

---

The use of Big Data and Artificial Intelligence is changing the way insurance firms design, sell and market insurance products to consumers. Increased data availability about insurance consumers coupled with enhanced processing capabilities of insurance firms will result in increasingly personalised insurance offers to consumers. While certain segments of consumers could benefit from increased personalisation, there are also clear risks and new vulnerabilities that could emerge as a result. European policymakers and supervisors need to ensure that innovations in insurance are consumer-friendly, and do not lead to new forms of financial exclusion.

Insurance consumers need clearly defined legal rights when it comes to the use of Artificial Intelligence and Algorithmic Decision Making, including:

- Right to transparency, explanation and objection
- Right to accountability and control
- Right to fairness
- Right to non-discrimination
- Right to safety and security
- Right to access to justice
- Right to reliability and robustness
- Right to privacy and data protection

## 1. Big data and AI in insurance

---

The use of algorithms and Big Data Analytics (BDA) is set to profoundly transform the insurance sector. Increased data availability to insurers coupled with enhanced processing capabilities will result in increasingly personalised and tailored offers to insurance consumers. Digital advances could allow certain segments of consumers to benefit from more targeted and personalised insurance offers, including potentially better premiums when taking out insurance products. However, such evolutions equally raise concerns related to privacy and data protection, fairness and potential financial exclusion. A shift towards big data analytics and artificial intelligence deserves proper scrutiny by European policymakers and supervisors alike to ensure that innovations are consumer-friendly.

The growing use of Artificial Intelligence (AI) and Algorithmic Decision Making (ADM) in insurance could have detrimental outcomes for consumers. First of all, the use of AI increases the risk of consumers being manipulated and becoming subject to discriminatory treatment and arbitrary, non-transparent decisions. Significant assumptions about consumers' attributes, conditions and behaviour can be made using AI. It is essential, particularly in the area of insurance, to ensure that AI is used in a fair, safe and transparent manner and that consumers are strongly protected against abuse. To start with, it must be ensured that ADM systems used in the insurance sector are subject to comprehensive risk assessments. Supervisory authorities should have the competence to impose the necessary documentation, certification and transparency measures, depending on the level of risk. For applications that present the highest levels of risk, ex-ante scrutiny procedures (e.g. pre-approval before market deployment, publication of impact assessments) should be put in place.

Secondly, the use of AI and ADM depends on the processing of large amounts of data, that could affect consumer privacy and personal data protection. Consumers are not always aware what range of personal data, such as those gained from social media activity or other information gained by insurers through third parties, is being used to make decisions about the price and availability of insurance products. As firms increase the range of data that they consider, consumers and supervisors will need more transparency about the data processing activities of insurance firms. It must be ensured that firms using consumers personal data do so in full respect of the General Data Protection Regulation (GDPR) and that there are clear limitations in terms of what data can or cannot be used and for what purposes.

With increasingly powerful algorithms at their disposal, insurers will be incentivised to collect a wider array of data about consumers, yielding new insights about the likelihood of a consumer making a claim. Big Data Analysis by insurance firms could in future lead to hyper personalised risk assessments, leaving certain and possibly broader segments of consumers 'uninsurable'. New data practices could also allow firms to charge more individualised prices and lead to discriminatory price optimisation practices. Significant concerns around privacy and personal data protection and new forms of nudging are emerging, where insurers are relying on Big Data and using incentives to change the behaviour of consumers in ways that could be viewed as intrusive and manipulative by consumers. Strong consumer rights are a necessary pre-condition to minimise the potential risks associated with these digital transformations and to ensure that consumers and society as a whole can benefit from these innovations.

Big Data and AI will increasingly be embedded across the insurance value chain and have an impact on consumers. Innovative uses of consumer data can contribute to improving the quality of financial services, but there are serious concerns about undesirable developments and potential consumer detriment.

The impact of Big Data on the provision of financial services is rightly high on the agenda of European supervisory authorities and policymakers. In 2019, the European Insurance and Occupational Pensions Authority (EIOPA) published its Thematic Review into Big Data Analytics in Motor and Health Insurance.<sup>1</sup> EIOPA has also established a Consultative Expert Group on Digital Ethics to assess the opportunities and risks arising from BDA and digitalisation.

**Insurance consumers need clearly defined legal rights when it comes to the use of Artificial Intelligence and Algorithmic Decision Making<sup>2</sup>:**

<p><b>RIGHT TO TRANSPARENCY, EXPLANATION, AND OBJECTION</b></p>	<p>Insurance consumers must be informed about the extent and the purposes of the processing of their personal data, must be able to have a clear and understandable explanation on <b>how the decision on their insurance policy was made</b>, they must be informed on the use of Artificial Intelligence and Algorithmic Decision Making. Consumers must be able to understand the logic behind the automated decisions and what <b>rating criteria</b> are considered by insurers. Consumers should have a <b>right to object</b> to any AI/ADM decisions taken about them and seek a second opinion.</p>
<p><b>RIGHT TO ACCOUNTABILITY AND CONTROL</b></p>	<p>Algorithm-based tools in insurance must undergo a <b>thorough assessment</b> before their launch, including a detailed impact and risk assessment. Throughout a product’s lifecycle, their performance must be <b>monitored</b> and <b>assessed</b> by insurance firms and <b>dedicated public authorities</b>. Insurance firms must put in place the necessary measures to ensure legal compliance of their ADM tools and be able to demonstrate such compliance.</p>
<p><b>RIGHT TO FAIRNESS</b></p>	<p>Fairness of algorithms used in insurance must be guaranteed to avoid potential bias in decision-making. <b>Unfair rating criteria</b> used by insurance firms should be <b>banned</b> by policymakers and/or supervisors. Firms should be prohibited from <b>setting prices</b> based on consumers individual <b>price sensitivity</b> or their likelihood to switch insurance contracts. Premiums should be set based on information that is directly pertinent to the pricing of insurance, including the risk and/or the cost of the individual policyholder.</p>
<p><b>RIGHT TO NON-DISCRIMINATION</b></p>	<p>Insurers will consider an increasingly wide(r) range of personal data when selling policies to consumers. The use of such data and the output of the AI/ADM systems must be <b>thoroughly and independently monitored</b> by public authorities to ensure that consumers are not unfairly discriminated against. In particular, the potential of <b>proxy discrimination</b> through AI demands careful regulatory safeguards and public scrutiny by independent supervisors.</p>

<sup>1</sup> EIOPA, ‘Thematic Review into Big Data Analytics in Motor and Health Insurance’, [https://www.eiopa.europa.eu/content/eiopa-reviews-use-big-data-analytics-motor-and-health-insurance\\_en](https://www.eiopa.europa.eu/content/eiopa-reviews-use-big-data-analytics-motor-and-health-insurance_en).

<sup>2</sup> For further information about the consumer rights necessary to ensure the use of Artificial Intelligence and automated decision making is consumer-friendly, please consult our position papers on [‘AI Rights for Consumers’](#) and [‘Automated Decision Making and Artificial Intelligence – A Consumer Perspective’](#).

<p><b>RIGHT TO SAFETY AND SECURITY</b></p>	<p>AI tools in insurance must be <b>safe and secure</b> by design. Security and safety are key elements in all AI and ADM systems, they must be factored in from the conception of the system and throughout their lifecycle and use. Consumers should be able to trust that AI tools used in insurance do not represent a risk for their safety and that they are adequately protected against cyberattacks. Insurance firms should minimise risks, and public authorities must ensure a proper regulatory oversight.</p>
<p><b>RIGHT TO ACCESS TO JUSTICE</b></p>	<p>In case of damage occurring due to AI decisions in insurance, consumers must have <b>a right to redress. Public enforcers should be active and have expertise to stop the breaches of rules.</b> Regular dialogue and cooperation between financial supervisors, data protection authorities and competition authorities must be promoted to ensure adequate oversight of AI and ADM systems. Insurers must be <b>thoroughly and independently monitored</b> by public authorities to guarantee the aforementioned rights. Organisations and individuals developing, deploying or operating AI systems should be held accountable for their proper functioning.</p>
<p><b>RIGHT TO RELIABILITY AND ROBUSTNESS</b></p>	<p>Algorithms in insurance must be constantly scrutinised by policymakers and public authorities to ensure their <b>high reliability</b> and <b>trustworthiness</b>. The data that AI systems rely on when taking decisions about insurance consumers must be accurate.</p>
<p><b>RIGHT TO PRIVACY AND DATA PROTECTION</b></p>	<p>Algorithm-based tools in insurance must respect EU rules<sup>3</sup> on <b>privacy</b> and <b>data protection</b>. Without protection of private life, there is no freedom for the citizen. Consumers should continue to be able to access insurance policies that do not rely on intrusive data processing practices or behavioural analysis.</p>

**For more information**

BEUC Position Paper [“Automated Decision Making and Artificial Intelligence: A consumer perspective”](#) (BEUC-X-2018-058)

BEUC Position Paper [“AI Rights for Consumers”](#) (BEUC-X-2019-063)

<sup>3</sup> E.g. the Charter of Fundamental Rights of the European Union, articles 7, 8 and 52, (2012/C 326/02). The fact that the respect for private and family life (article 7) and the protection of personal data (article 8) were formulated in separate articles did not intend to break the fundamental link between the two, nor does it result in it.

## 2. Personalised pricing in insurance markets: A price of one's own?

The expanding use of BDA in an increasingly digitalised insurance sector will allow firms to charge differential prices to groups of consumers, leading to more personalised pricing based on the behavioural characteristics and personal data of consumers. While personalised pricing could bring benefits to certain segments of consumers, evidence is beginning to emerge of pricing practices in the insurance sector that fail to treat consumers fairly, with insurers engaging in harmful price optimisation techniques. The growing use of BDA could allow insurers to better understand aspects such as a consumer's individual price sensitivity and their likelihood to shop around or switch insurance at the point of renewal. Firms may increasingly charge prices based on the optimum amount of margin they can earn from an individual consumer, rather than the risk and/or cost of the individual policyholder.

The possibility of unfair outcomes for consumers is significant. In 2018, our UK member Citizens Advice submitted a super-complaint to the UK's Competition and Markets Authority (CMA) concerning unfair pricing practices in essential consumer markets, including the market for home insurance policies.<sup>4</sup> Detailed research carried out by Citizens Advice revealed that 'loyal' home insurance consumers are often charged significantly higher prices compared to new customers.<sup>5</sup> As a result, Citizens Advice estimates that **1 in 3 customers in the United Kingdom could be paying up to 70% more for their home insurance contracts** compared to new consumers that regularly switch insurers.

In response to the Citizens Advice findings, the UK Financial Conduct Authority (FCA) carried out a thematic review into the pricing practices of general insurance contracts, including motor insurance and home insurance policies.<sup>6</sup> The thematic review corroborated many of Citizens Advice's initial findings, with the FCA finding widespread evidence of consumers paying a 'loyalty penalty': longstanding insurance consumers often paid more on average compared to new customers of insurance firms. The FCA review determined that firms were specifically targeting price increases to consumers considered less likely to switch, hiking premiums for 'loyal consumers' in the knowledge that they were less likely to switch insurance contracts. The FCA concludes that increasing amounts of consumers data available to insurers could "widen price differentials between [those] consumers who actively shop around and switch, and those who do not."

"The information used in the model includes customer characteristics gained both from information provided by both the customer and wider externally available information. Firms also take account of other factors such as the distribution channel, or product purchased, to estimate how likely a customer will be to buy and renew at different price levels over time."

General Insurance Pricing Practices, Interim Report, Financial Conduct Authority

The FCA evidence shows that firms increasingly use 'rating factors' unrelated to risk when setting insurance premiums for consumers. Firms use numerous 'rating factors' in their pricing models based on both internal data (including data collected directly from the consumer) and externally derived data from third sources. The FCA study found evidence that prices were set based on where consumers shop, **what other products that they buy**, a customer's **buying and media habits**, and which **internet browser they use to surf the web**. Insurers also often consider information related to the **time of day**

<sup>4</sup> Citizens Advice, 'Excessive prices for disengaged consumers', [https://www.citizensadvice.org.uk/Global/CitizensAdvice/Consumer%20publications/Super-complaint%20-%20Excessive%20prices%20for%20disengaged%20consumers%20\(1\).pdf](https://www.citizensadvice.org.uk/Global/CitizensAdvice/Consumer%20publications/Super-complaint%20-%20Excessive%20prices%20for%20disengaged%20consumers%20(1).pdf).

<sup>5</sup> Citizens Advice, 'The insurance loyalty penalty: unfair pricing in the home insurance market', <https://www.citizensadvice.org.uk/about-us/policy/policy-research-topics/consumer-policy-research/consumer-policy-research/the-insurance-loyalty-penalty-unfair-pricing-in-the-home-insurance-market/>.

<sup>6</sup> FCA, General Insurance pricing practices Market Study, <https://www.fca.org.uk/publications/market-studies/ms18-1-general-insurance-pricing-practices-market-study>.

**and the month that an insurance policy is bought** when setting prices. The FCA also concluded that consumers “**may not always be aware of how their personal data and data from external sources are being used in calculating the price of their policy.**”<sup>7</sup> Pricing practices are not transparent, and consumers are often unaware that they are facing price discrimination.



### ***Who is harmed by the price discrimination practices of insurance firms?***

Vulnerable and disengaged insurance consumers are particularly at risk of being negatively affected by unfair pricing practices. According to FCA research, 1 in 3 customers paying higher premiums showed at least one characteristic of vulnerability, such as having a lower financial capability or coming from a lower-income group. Overall, 6 million policyholders paid higher prices in 2018, with 2 million of these consumers exhibiting at least one characteristic of vulnerability. As a result, the FCA estimates that £1.2bn was overpaid by insurance consumers in 2018.

Technological advances will enable firms to develop ever-more sophisticated pricing techniques based on growing volumes of consumer data, leading to discriminatory pricing practices and unfair outcomes for consumers. Price optimisation practices by insurers have already drawn significant attention by other regulators and supervisors worldwide:

- In the **United States**, the Consumer Federation of America found evidence<sup>8</sup> that insurance companies used price optimisation practices to set consumers’ premiums based on the individual shopping habits and a consumer’s individual tolerance for price changes, with up to half (45%) of large insurance companies engaged in price optimisation practices when setting premiums for consumers.<sup>9</sup> Similarly, auto insurance firms in the United States have faced accusations of using algorithms to set prices based on the individual probability of consumers switching to another firm.<sup>10</sup> In 2015, the National Association of Insurance Commissioners (NAIC) published a White Paper<sup>11</sup> on the use of price optimisation practices by US insurance firms. The White Paper included a recommendation that “two insurance customers with the same risk profile should be charged the same premium for the same coverage.” The White Paper also assessed that pricing practices based on (a) price elasticity of demand (b) propensity to shop around for insurance are unfairly discriminatory. Following the publication of the White Paper, several U.S. states subsequently issued prohibitions on price optimisation practices by insurers when selling retail insurance policies. As of 2017, at least 20 US States banned price optimisation practices used by US insurers.<sup>12</sup>

<sup>7</sup> FCA, ‘General insurance pricing practices’, <https://www.fca.org.uk/publication/market-studies/ms18-1-2-interim-report.pdf>, p. 23.

<sup>8</sup> Insurance Business America, ‘Colorado 15<sup>th</sup> state to ban price optimisation’, <https://www.insurancebusinessmag.com/us/news/breaking-news/colorado-15th-state-to-ban-price-optimization-27083.aspx>

<sup>9</sup> Insurance Journal, ‘The Price of Price Optimization in Insurance’, <https://www.insurancejournal.com/news/national/2015/11/17/389153.htm>

<sup>10</sup> TheMarkup, ‘Suckers List: How Allstate’s Secret Auto Insurance Algorithm Squeezes Big Spenders’, <https://themarkup.org/allstates-algorithm/2020/02/25/car-insurance-suckers-list>.

<sup>11</sup> National Association of Insurance Commissioners, ‘Price Optimization White Paper’, [https://www.naic.org/documents/committees\\_c\\_catf\\_related\\_price\\_optimization\\_white\\_paper.pdf](https://www.naic.org/documents/committees_c_catf_related_price_optimization_white_paper.pdf).

<sup>12</sup> Consumer Federation of America, ‘Consumer Groups Applaud NVA Insurance Commissioner for Banning Price Optimization and Closing the ‘Underwriting’ Loophole’, [https://consumerfed.org/press\\_release/consumer-groups-applaud-nevada-insurance-commissioner-banning-price-optimization-closing-underwriting-loophole/](https://consumerfed.org/press_release/consumer-groups-applaud-nevada-insurance-commissioner-banning-price-optimization-closing-underwriting-loophole/)

- In **Ireland**, a complaint<sup>13</sup> was submitted to the Central Bank of Ireland and the Competition and Consumer Protection Commission about unfair price discrimination in the Irish insurance market, with insurance companies discriminating against existing customers by giving inflated renewal prices for insurance contracts. Following the complaint, the Central Bank of Ireland opened an investigation<sup>14</sup> and announced that it will carry out a study into the pricing practices of Irish insurance firms.
- In **India**, differential pricing on the basis of customer demand and/or consumer willingness to pay is not allowed. Product pricing is subject to regulatory approval by the Insurance Regulatory and Development Authority (IRDA). Premiums may be varied based only on narrowly defined rating criteria.<sup>15</sup>

### RECOMMENDATIONS

- A ban on unfair price optimisation practices when selling insurance products to consumers. Firms should be prohibited from setting prices based on consumers individual price sensitivity or their likelihood to switch insurance contracts.
- Firms should be required to publish information about the price differentials between their customers. This could increase competitive pressures for insurers and ensure public and supervisory scrutiny to ensure that the pricing practices of firms are fair towards consumers.

## 3. Data granularity and high-risk consumers: A risk class of one's own?

Customer segmentation on the basis of risk has always been a core feature of private insurance contracts, with high-risk consumers generally paying higher premiums compared to consumers perceived to be of a lower risk. However, whereas historically risk-based pricing was based on a limited number of easily identifiable criteria, the proliferation of data about consumers will allow insurers to consider a wider array of personal and behavioural data and charge corresponding premiums. Increased granular risk modelling could benefit groups currently perceived to be of a higher risk (e.g. the elderly or other vulnerable groups), but who can demonstrate that their risk is lower than simpler risk models may traditionally assume.

But equally, the use of AI could allow insurers to easily identify high risk characteristics and result in categories of consumers no longer able to access or afford insurance cover. In due time, increasingly sophisticated profiling could reduce the availability, access and affordability of insurance. Risk segmentation that allows insurers to cherry-pick 'good risk' from 'bad risk' could lead to increasingly differentiated pricing between low- and high-risk insurance consumers. More granular risk-based pricing could be seen as especially unfair if it is done on the basis of personal characteristics over which consumers have no control (for instance, genetic data).

Increasingly personalised insurance products would undo the traditional principle of 'solidarity' or 'risk pooling' that has always been at the core of the insurance business model since its establishment. If insurance firms calculate every individual's personal risk and corresponding premium, insurance firms would no longer be spreading out risk

<sup>13</sup> Sinn Fein, 'Price Discrimination in the Insurance Market: A complaint to the Central Bank of Ireland', [https://www.sinnfein.ie/files/2019/Price\\_Discrimination\\_in\\_the\\_Insurance\\_Market\\_A\\_Complaint\\_to\\_the\\_Central\\_Bank\\_of\\_Ireland.pdf](https://www.sinnfein.ie/files/2019/Price_Discrimination_in_the_Insurance_Market_A_Complaint_to_the_Central_Bank_of_Ireland.pdf).

<sup>14</sup> Central Bank of Ireland, 'Review of differential pricing in the motor and home insurance industries', <https://www.centralbank.ie/docs/default-source/Regulation/industry-market-sectors/insurance-reinsurance/solvency-ii/communications/dear-ceo-letter---review-of-differential-pricing-in-the-motor-and-home-insurance-industries-21-november-2019.pdf>.

<sup>15</sup> IAIS, 'Draft Issues Paper on the Use of Big Data Analytics in Insurance', <https://www.iaisweb.org/page/consultations/closed-consultations/2019/draft-issues-paper-on-use-of-bda-in-insurance//file/84093/draft-issues-paper-on-use-of-bda-in-insurance-for-public-consultation>, p. 21.

collectively between policyholders. Further risk segmentation will also be increasingly based on actual behaviour by consumers, for example using telematics-generated data. Already evidence is emerging of more granular segmentation by insurers resulting in higher premiums and/or potential financial exclusion of consumers:

- In **Australia**, the Competition and Consumer Commission found evidence<sup>16</sup> that: "Over the past decade, insurers' methodologies for pricing insurance have become much more sophisticated and combined with access to better data, we have seen a shift towards more address based risk assessment and pricing. As a result, insurance premiums are increasing, especially for those in high risk areas." The Inquiry found that "more granular pricing approaches, in particular address-based risk assessment, has been a key contributor to increased premiums for many consumers."
- In **The Netherlands**, insurance firms increasingly rely on Big Data techniques when setting premiums for home insurance policies. Based on publicly available data about the building type, building year, and construction costs of homes, firms are using tailored data and BDA tools to adapt home insurance premiums. According to research<sup>17</sup> by our Dutch member Consumentenbond, firms relying on new BDA practices significantly increased prices for certain customers. In a typical case, a Dutch insurance consumer witnessed a 30% premium hike for his home insurance policy, following a re-assessment based on the use of BDA tools. Insurance firms frequently did not carry out house visits to establish if the information they relied upon in their BDA analysis was correct (in certain cases, the information was demonstrably wrong).

Hyper personalised risk assessments could leave certain individuals 'uninsurable' and lead to new forms of financial exclusion in future. Stronger oversight is necessary as to what types of personal data insurers should be allowed to consider when selling insurance contracts and setting premiums. Public authorities should closely monitor whether the use of Big Data and AI has an impact on the insurability of high-risk consumers and may need to intervene to ensure people continue to have adequate access to insurance policies. Limits to certain forms of granularity in risk-based pricing may need to be considered or limitations on the types of data points that are considered by insurance firms when setting insurance premiums, as recommended by the recent conclusions of the German Data Ethics Commission<sup>18</sup>:

**"Stringent requirements and limitations should be imposed on the use of data for personalised risk assessment (e.g. the "black box" premiums in certain insurance schemes.) In particular, the processing of data may not intrude on intimate areas of private life, there must be a clear causal relationship between the data and the risk, and the difference between individual prices charged on the basis of personalised and non-personalised risk assessments should not exceed certain percentages (to be determined). There should also be stringent requirements in respect of transparency, non-discrimination and the protection of third parties."**

Recommendations of the German Data Ethics Commission for the Federal Government's Strategy on Artificial Intelligence

Increased transparency will also generally be necessary in future for consumers and public authorities alike about the types of personal data considered by insurers when selling policies to consumers and about how algorithmic decisions that affect them are made. In

<sup>16</sup> Australian Competition and Consumer Commission, 'Northern Australia Insurance Inquiry', <https://www.accc.gov.au/system/files/Northern%20Australia%20Insurance%20Inquiry%20-%20First%20interim%20report%202018.PDF>

<sup>17</sup> Consumentenbond, 'Premies woonhuisverzekeringen stijgen door gebruik Big Data', <https://www.consumentenbond.nl/nieuws/2018/premies-woonhuisverzekeringen-stijgen-door-gebruik-big-data>

<sup>18</sup> German Data Ethics Commission, 'Opinion of the Data Ethics Commission', [https://www.bmjv.de/SharedDocs/Downloads/DE/Themen/Fokusthemen/Gutachten\\_DEK\\_EN.pdf?\\_\\_blob=publicationFile&v=2](https://www.bmjv.de/SharedDocs/Downloads/DE/Themen/Fokusthemen/Gutachten_DEK_EN.pdf?__blob=publicationFile&v=2), p. 11.

particular, firms will need to be more transparent about the data points they take into consideration when deciding whether to offer an insurance policy to a consumer, or when setting individual premiums, as well as about the role of ADM systems in setting the premiums and the rationale behind the functioning and results of such systems. As firms increase the range of data they consider (including data obtained through third parties) and their use of AI tools, such transparency will be necessary to build trust with consumers and ensure that regulators have access to the necessary information to design appropriate regulatory responses.

Already, certain countries have recognised the need for enhanced disclosure about the type of data that is considered about consumers when selling insurance contracts. In 2014, the Belgian government introduced new disclosure requirements on Belgian insurers offering essential insurance policies to consumers:

### CASE STUDY: TRANSPARENCY OF SEGMENTATION CRITERIA IN BELGIUM

In 2014, the Belgian government adopted legislation<sup>1</sup> to increase the consumer protection of insurance policyholders when buying essential insurance products. Under Belgian law, insurance consumers must have **full transparency about which rating criteria are taken into account by insurers when selling insurance contracts to consumers**. Since 2014, the Financial Services and Markets Authority (FSMA) requires insurance undertakings to publish on their website the segmentation criteria that they use to assess:

- If they will **offer** the insurance to a consumer
- To set the **cost** of the insurance policy

The law applies for six different types of insurance policies, including motor, fire, life, health, legal assistance, and civil liability insurance. To exclude any arbitrary differentiation or discrimination by insurers, **the criteria chosen by the firm must correspond to a legitimate objective**. Any factors used to price customers insurance policies differently must be linked to their underlying insurance risk. Insurers are also required to **explain** on their website **why they have chosen certain segmentation criteria** (without using technical jargon). Insurers also have an obligation to justify their reasons for refusing a person insurance coverage. The Belgian FSMA regularly tests the objectivity of the criteria chosen by insurance firms. In addition, under the Belgian law, powers exist to ban the use of certain segmentation criteria in case of consumer protection concerns.

**For example, see below the rating criteria applied by Belgian insurer NN Insurance Belgium and broker ING when selling an 'Outstanding Balance Insurance for Mortgage Loans'<sup>19</sup>:**

Please find below an explanation of the segmentation criteria we apply.

- ✓ **The insured capital (AC, PC):** The insured capital has an impact on the amount of the premium, as it is directly linked to the risk to be insured.
- ✓ **The duration of the contract (AC, PC):** The duration of the contract may have an impact on the amount insured, and may therefore influence the amount of the premium.
- ✓ **The financial acceptance (AC):** If the total capital amount insured by NN Insurance Belgium SA/NV exceeds €1 million, we will assess your financial situation.
- ✓ **Your health condition (AC, PC, GC):** We will make enquiries into your health through a questionnaire or by performing a medical examination. If, at the time you take out the contract, you are aware of any health problems which affect your risk of premature death, we will take these into account. If after carrying out the questionnaire or medical exam we are still unable to establish a sufficiently clear picture of your health, we may ask you to answer additional questions, or to provide us with further information.

<sup>19</sup> Further information is available on the ING website by clicking on the tab 'Segmentation policy': <https://www.ing.be/en/retail/insurances/decease/decreasing-life-insurance-linked-to-a-mortgage-loan>

	Acceptance Criteria (AC)	Pricing Criteria (PC)
Insured capital	✓	✓
Duration of the contract	✓	✓
Financial acceptance	✓	
Health condition	✓	✓
Age	✓	✓
Smoking behaviour		✓

### RECOMMENDATIONS

- Authorities should oblige insurers to be fully transparent about the rating criteria and ADM systems they use, in a simple, transparent, and explainable way. Rating criteria used by insurers to set prices and/or to determine whether the insurer will offer a policy should be fully transparent to the consumer.
- To exclude any arbitrary differentiation or discrimination by insurer, the rating criterions chosen by firms should have a 'legitimate objective'. Premiums should be set based on information that is directly pertinent to the pricing of insurance, including the risk and/or the cost of the individual policyholder. Insurance firms should not use data sources that are unrelated to the insured risk that the consumer represents: a clear causal relationship between the data used and the risk of the insurance policyholder should be required.
- Supervisors and/or public authorities should investigate whether certain types of personal data should not be used in risk assessments by insurers in case of evidence of consumer and data protection concerns or dangers of unfair discrimination. Insurance supervisors should assess whether the use of certain types of personal data should be subject to certain conditions (for instance, explicit consent by the consumer).
- Public regulatory and supervisory authorities should closely monitor price differentials charged between individual policyholders for insurance contracts to assess the impact of big data on the insurability of high-risk consumers. In cases of consumer detriment, restrictions on the scope of individual risk-based pricing should be introduced for essential insurance contracts.

## 4. Personalisation, micro-targeting and discrimination

Consumers should have a right to be protected from discrimination when taking out insurance contracts. The growing use of AI and ADM in insurance carries the risk of unjustified discrimination and potential financial exclusion of consumers. There is growing evidence of financial services firms engaging in potentially discriminatory practices when selling their services to clients:

- In the **United Kingdom**, car insurance comparison websites reported higher premiums for people with names suggesting that they are from ethnic minorities according to a BBC investigation.<sup>20</sup> The BBC obtained car insurance quotes from five leading price comparison websites, first using the name of a white British BBC

<sup>20</sup> BBC, 'Insurers risk breaking racism laws', <https://www.bbc.com/news/business-43011882>

producer, and secondly a different common British name from an ethnic minority. All five price comparison sites returned higher prices for the latter name. On average, the cheapest quotes increased by between £140 and £280. In addition, a similar investigation found that drivers who use certain email providers were more likely be charged higher premiums for their insurance policies (i.e. Hotmail users were charged higher premiums than users of Google Mail).<sup>21</sup>

- In the **United States**, an inquiry was launched by US financial regulators following complaints that the Apple's credit card offered different credit limits for men and women. Users of the credit card service noticed that women were frequently offered smaller lines of credit compared to men, leading to allegations of gender bias.<sup>22</sup>
- In the **United States**, the New York Times<sup>23</sup> reported that credit card companies started cutting cardholders' credit limits when charges appeared for marriage guidance counselling, since marriage breakdown is highly correlated with debt default. Other credit card companies started cutting cardholders credit lines when charges appeared for pawnshops.

As evidenced by the above case studies, the increased personalisation and targeting of financial services can lead to discriminatory outcomes for consumers. Of course, insurers are prohibited by law from basing pricing and claims decisions based on certain protected characteristics, including for instance gender and ethnicity. However, other types of data points could feasibly act as proxies for these traits or could closely be correlated with protected characteristics such as race and/or gender (for instance, postcodes signalling ethnicity or occupation categories signalling gender) and lead to proxy discrimination instead. The fact that AI systems can learn from data does not guarantee that their outputs will be free of human bias or discrimination, and there is plenty of evidence of AI systems picking up existing human biases or historic discrimination.<sup>24</sup>

The ongoing UK review into pricing practices of insurance firms found no direct evidence that firms were engaging in price discrimination based on the protected characteristics of consumers. However, the UK Financial Conduct Authority (FCA) did find evidence that firms were using datasets (including datasets purchased from third parties) that contained "factors that could implicitly or potentially explicitly relate to race or ethnicity."<sup>25</sup> The FCA also raised concerns that firms were often not exercising sufficient due diligence to ensure that the personal data considered did not "include factors that might have the potential to discriminate based on protected characteristics."<sup>26</sup>

Many situations cannot be properly tackled using anti-discrimination laws, as they traditionally focus on discrimination based on protected characteristics, such as skin colour. AI system can use classes and categories for differentiation that do not (directly) relate to protected characteristics. The higher the societal risk of such proxy discrimination, the greater is the need for regulatory safeguards and public scrutiny. Consumers are worried about the risks posed by algorithmic decision making and would like to see public control over the use of this technology. According to a survey<sup>27</sup> by our German member vzbv, nearly 80% of consumers said that supervisory authority should be able to check whether automated decisions comply with applicable laws, and 75% said that automated decisions about consumers are regarded as a risk if the underlying data and principles applied are unclear:

---

<sup>21</sup> Decision Marketing, 'Admiral Insurance hit by big data discrimination claims', <https://www.decisionmarketing.co.uk/news/admiral-insurance-hit-by-big-data-discrimination-claims>

<sup>22</sup> BBC News, 'Apple's 'sexist' credit card investigated by US regulator', <https://www.bbc.com/news/business-50365609>.

<sup>23</sup> The New York Times Magazine, 'What does your credit card company know about you?', <https://www.nytimes.com/2009/05/17/magazine/17credit-t.html>

<sup>24</sup> ICO, 'Human bias and discrimination in AI systems', <https://ico.org.uk/about-the-ico/news-and-events/ai-blog-human-bias-and-discrimination-in-ai-systems/>

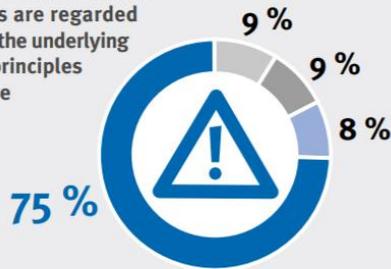
<sup>25</sup>FCA, 'Pricing practices in the retail general insurance sector: household insurance', <https://www.fca.org.uk/publication/thematic-reviews/tr18-4.pdf>, p. 15.

<sup>26</sup>FCA, 'Pricing practices in the retail general insurance sector: household insurance', <https://www.fca.org.uk/publication/thematic-reviews/tr18-4.pdf>, p. 15.

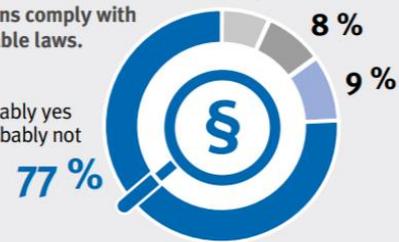
<sup>27</sup> VZBV, 'Artificial intelligence: Trust is good, control is better', [https://www.vzbv.de/sites/default/files/2019\\_vzbv\\_factsheet\\_artificial\\_intelligence\\_0\\_0.pdf](https://www.vzbv.de/sites/default/files/2019_vzbv_factsheet_artificial_intelligence_0_0.pdf)

## BLACK BOX ALGORITHMS: ENABLING EXTERNAL AUDITING

Automated decisions about consumers are regarded as a risk if the underlying data and principles applied are unclear.



Supervisory authorities should be able to check whether automated decisions comply with applicable laws.



■ yes, absolutely/probably yes  
 ■ no, definitely not/probably not  
 ■ don't know  
 ■ undecided

Source: Representative online survey conducted by Civey on behalf of vzbv, December 2017.

Percentage totals may add up to more than 100 percent due to rounding.

Rules governing the use of algorithms and AI are therefore needed. Supervisors may need, for example, powers to eliminate the use of certain data points that are unnecessary or could be potential sources of biases, and regularly audit algorithms in order to detect potentially unlawful discriminatory outcomes.

In addition, insurers should thoroughly test AI models prior to their launch to ensure that there are no possible discriminatory outcomes. All insurers must have in place systems and processes to ensure that AI applications do not generate discriminatory outcomes. If discriminatory biases in AI applications cannot be effectively avoided, then insurers should not deploy these applications. Insurers should only use AI models if it can be clearly established with sufficient certainty that the model will not generate any prohibited discriminatory outcomes. Where risks of discriminatory outcomes are determined to be high and the impact on consumers could be significant, regulatory approval prior to market deployment should be envisaged.

### RECOMMENDATIONS

- A horizontal legal framework should be adopted setting out the main principles to regulate AI and ADM systems and ensure fairness, transparency, accountability and control (see our position paper on '[AI Rights for Consumers](#)'). New regulations should follow the general principle that the higher the potential adverse impacts of the use of algorithmic decision making and AI technology, the stronger the appropriate regulatory response must be. The impact of AI and ADM could be significant for insurance consumers and adequate rights need to be safeguarded.
- Supervisory authorities should be equipped and able to check whether automated decisions about consumers comply with applicable laws. Lawmakers should adopt rules for an effective auditing system able to check relevant automated decision making. This would ensure that anti-discrimination laws and rules on unfair commercial practices and data practices are upheld and correctly applied. Thorough impact assessments and regulatory approval prior to market deployment should be envisaged for those AI and ADM applications that entail a high risk for the consumer.

## 5. Reliability and data quality

The quality of AI models and Big Data techniques depends on input data. The effectiveness and reliability of an algorithm is dependent on the quality, accuracy and completeness of the available data, and can be hampered by possible errors. Insurers who offer premium rewards or apply premium increases based on consumer data or behaviour must do so on the basis of objective and accurate information. It is therefore crucial to ensure the data quality and the suitability of data for the intended AI applications in insurance. This focus is even more relevant in cases where insurers rely on data from external sources to enrich

existing datasets or to develop AI applications. According to the Dutch Authority for Financial Markets, practical experience suggests that “the quality and accessibility of data, the volume, completeness and quality of data sometimes still falls considerable short of expectations and is too sub-standard to allow deployment of machine learning on a broad scale.”<sup>28</sup>

Parallels can be drawn to the consumer credit area, where there is evidence from our members of firms often relying on inaccurate consumer data when assessing the creditworthiness of individuals. For instance, in 2014, our UK member Which? carried out research which showed that a third of credit reports provided by the main credit reference agencies Experian, Equifax and Callcredit contained a problem or an entry which they would dispute. Similar issues could become increasingly common in the insurance sector as firms increase the range of data they consider. In this context, consumers need an understanding of what data insurers consider when setting insurance premiums to be able to challenge erroneous information held about them.

In cases where alternative data derived from non-insurance contexts is used, conflicts may arise about the potential lack of consent to, and awareness of, the sharing of this data by the customer. Additionally, customers may be adversely impacted because of insurers making assumptions and decisions that are based on alternative data that is incomplete, inaccurate or irrelevant. If customers are not aware of this type of data being used for insurance purposes, they may not be in a position, or have had the opportunity, to correct potential inaccuracies at the data source or to object to their use, let alone to give their consent if it could have been required by law. There is a risk that consumers could be differentiated on the basis of wrong assumptions. Supervisors must be able to carefully monitor the reliability of algorithms, including the accuracy and the relevance of the data used.

### RECOMMENDATIONS

- Insurers should be responsible for ensuring that the data that they use about consumers is reliable. If there are doubts concerning the accuracy of data, then insurers should refrain from considering such data in their models.
- Users must have transparency about the type of data considered by insurance firms to be able to challenge any decisions arrived at about them.

## 6. Data protection and privacy-friendly insurance models

---

Insurers process consumer data to analyse the risk of individual policyholders. It must be ensured that firms who process consumers personal data do so in full respect of the General Data Protection Regulation (GDPR) and that there are clear limitations in terms of what data can or cannot be used and for what purposes. The GDPR already sets out some good principles to address risks stemming from the use of big data in insurance contracts, including key principles such as data minimisation (which limits the collection of personal information to what is directly relevant and necessary to accomplish a specified purpose) and accuracy (which requires the insurer to take all reasonable steps to ensure the personal data he holds is not incorrect, misleading and updated). Furthermore, the GDPR attributes some specific rights to the consumer, such as the right not to be subject to a decision based solely on automated processing, including profiling, which produces legal effects on him or significantly affects him. To ensure that the rights under the GDPR are respected, BEUC recommends more regular dialogue between financial supervisors, the European

---

<sup>28</sup> Dutch AFM, ‘Artificial intelligence in the insurance sector: An exploratory study’, <https://www.afm.nl/en/nieuws/2019/jul/verkenning-ai-verzekeringssector>.

Data Protection Board and national data protection authorities to ensure that consumers privacy is safeguarded.

For instance, the recent Regulation<sup>29</sup> on type-approval requirements for motor vehicles stipulates that vehicles must be fitted with systems which warn the driver in the event of drowsiness, loss of attention, distraction and with an event data recorder (EDR). The data collected in the event of an accident by this Event Data Recorder will be useful in determining the causes of it. The data collected by these systems during the movement of the vehicle, apart from any accident, will certainly be very useful for car manufacturers. However, this assumes that if the said manufacturer transfers this data to third parties such as insurers, he should obtain the consent of the driver of the vehicle under the conditions<sup>30</sup> required.

The growing use of data by insurance firms also trigger questions about the possible discrimination of privacy-minded consumers. The increased use of personal data and telematics-based monitoring in insurance could become very intrusive in people's personal lives, dictating how they drive, what they eat, how many daily steps they should take. Business models based on digital monitoring that reward or penalise certain lifestyle choices or behaviour that are deemed 'good' or 'bad' by an insurance firm could be considered very intrusive, paternalistic, or interfering with an individual's independence and freedom in his or her decision-making. Such intrusiveness would be considered particularly problematic if individuals were unable to access insurance without agreeing to mandatory monitoring of their behaviour.

At the moment, insurers primarily encourage consumers to adopt wearables or telematics with the promise of better premiums in return. However, voluntary data-sharing in exchange for more advantageous premiums could in future develop into mandatory requirements for accessing insurance products. While signing up to insurance schemes is currently a choice, it would be relative simply for insurers to turn voluntary schemes into mandatory ones. Already, evidence is beginning to emerge of insurers pushing for the mandatory adoption of telematics devices:

- In **Ireland**, insurer AIG is calling for legislation to make telematics-based insurance mandatory for all drivers under the age of 25.<sup>31</sup>
- In the **United States**, one of the largest life insurers John Hancock announced that it would no longer offer policies that do not include digital fitness tracking. Policyholders can earn discounts or rewards such as gift cards for hitting exercise targets.<sup>32</sup>

In future, consumers may increasingly be expected or even required to undergo intrusive monitoring processes when accessing insurance. Insurance executives have raised the possibility that access to life or health insurance could in future depend on being monitored by a wearable device: "No wearable device = no health insurance. This could be our reality in the next five to ten years. If you do not have a wearable device that tracks your health, then you will find it nearly impossible to life insurance."<sup>33</sup>

Consumers who choose to opt out of data sharing arrangements due to privacy concerns may also face future financial exclusion. Equally, there is a risk that privacy-minded consumers could get less advantageous premiums when purchasing insurance contracts

---

<sup>29</sup> Regulation (EU) 2019/2144 of the European Parliament and of the Council of 27 November 2019 on type-approval requirements for motor vehicles and their trailers, and systems, components and separate technical units intended for such vehicles, as regards their general safety and the protection of vehicle occupants and vulnerable road users

<sup>30</sup> Cf. articles 4 (11) and 7 of the GDPR and its recital 42, which refers o Directive 93/13 and its interpretation by the European Court of Justice as regards the form of the consent, namely clarity and simplicity.

<sup>31</sup> TheJournal.ie, 'AIG wants to make telematics-based insurance mandatory for all drives under 25', <https://www.thejournal.ie/telematic-insurance-aig-3667454-Oct2017/>.

<sup>32</sup> BBC News, 'John Hancock adds fitness tracking to all policies', <https://www.bbc.com/news/technology-45590293>.

<sup>33</sup> SwissInfo.ch, 'Insurers grapple with wearable big data revolution', <https://www.swissinfo.ch/eng/business/no-wearable--no-policy- insurers-grapple-with-wearable-big-data--revolution-/41381560>

compared to their counterparts willing to forego privacy concerns. Excessive differentiation in pricing based on a consumer's willingness to share data with insurers could be tantamount to levelling a 'privacy premium'. In the future, consumers may find it increasingly difficult to avoid opting in due to the financial disadvantages in doing so, and users may have no option but to hand over access to their data for accessing insurance. Consumers who choose not to allow their data to be shared with insurers could face restricted access, be required to pay higher premiums, or otherwise be excluded from taking out insurance contracts.

### RECOMMENDATIONS

- Stricter enforcement of existing data protection rules is required to ensure that insurance firms act in full compliance with the existing data protection rules under the General Data Protection Regulation.
- Consumers should continue to be able to access insurance policies that do not rely on intrusive data processing practices or behavioural analysis.
- Supervisors should closely monitor the prices between traditional insurance policies and policies that rely on personalised risk assessments for evidence of a 'privacy premium'. The difference between individual prices charged on the basis of personalised and non-personalised risk assessments should not exceed certain percentages.

### ENDS

#### For more information

- BEUC Position Paper ["Automated Decision Making and Artificial Intelligence: A consumer perspective"](#) (BEUC-X-2018-058)
- BEUC Position Paper ["AI Rights for Consumers"](#) (BEUC-X-2019-063)