



IN BRIEF

# BIG DATA ANALYTICS IN MOTOR AND HEALTH INSURANCE

**Data processing has historically been at the very core of the business of insurance undertakings**, which is rooted strongly in data-led statistical analysis. Data has always been collected and processed to inform underwriting decisions, price policies, settle claims and prevent fraud. There has long been a pursuit of more granular datasets and predictive models, such that the relevance of Big Data Analytics for the sector is no surprise.

In view of this, and as a follow-up of the Joint Committee of the European Supervisory Authorities cross-sectorial report on the use of Big Data by financial institutions, the European Insurance and Occupational Pensions Authority (EIOPA) launched a thematic review on the use of Big Data Analytics specifically by insurance firms. Through the review, EIOPA gathered further empirical evidence on the benefits and risks arising from Big Data Analytics. To keep the exercise proportionate, the focus was limited to motor and health insurance

lines of business. The thematic review was officially launched during the summer of 2018.

The thematic review has revealed a strong trend towards increasingly data-driven business models throughout the insurance value chain in motor and health insurance.

### THEMATIC REVIEW: WHO TOOK PART?

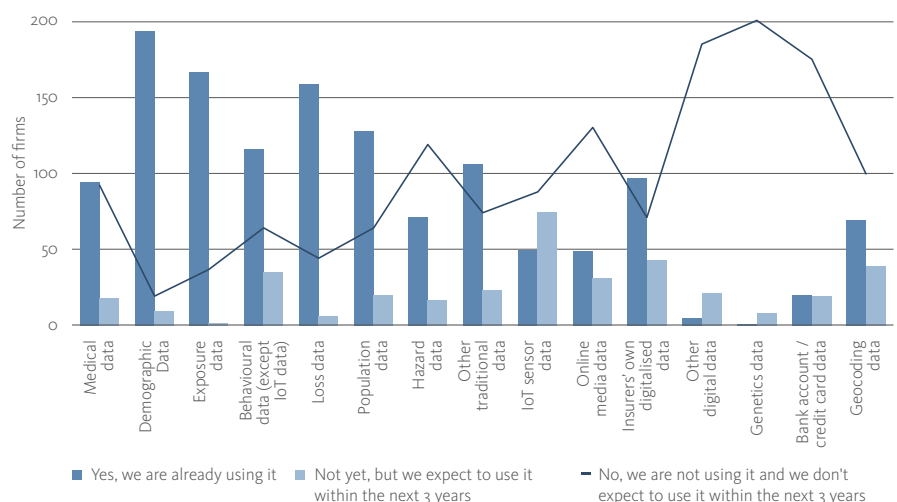
A total of 222 insurance undertakings and intermediaries from 28 jurisdictions have participated in the thematic review. The input collected from insurance undertakings represents approximately 60% of the total gross written premiums (GWP) of the motor and health insurance lines of business in the respective national markets, and it includes input from both incumbents and start-ups. In addition, EIOPA has collected input from national competent authorities (NCAs) from the European Economic Area, and from two consumers associations.

## KEY FINDINGS

**Traditional data sources such as demographic data or exposure data are increasingly combined (not replaced) with new sources** like online data or telematics data, providing greater granularity and frequency of information about consumer's characteristics, behaviour and lifestyles. This enables the development of increasingly tailored products and services and more accurate risk assessments.

**The use of data outsourced from third-party data vendors and their corresponding algorithms** used to calculate credit scores, driving scores, claims scores, etc. is relatively extended and this information can be used in technical models.

USAGE OF DIFFERENT TYPES OF DATA



## BIG DATA ANALYTICS TOOLS USED BY INSURANCE FIRMS

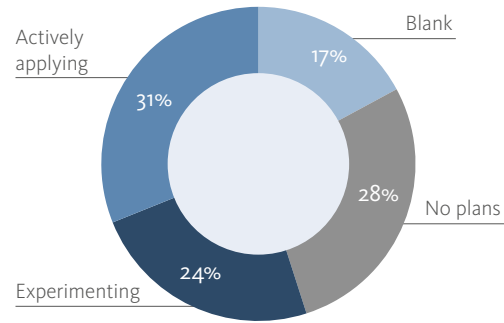
**Big Data Analytics tools such as artificial intelligence or machine learning are already actively used by 31% of firms, and another 24% are at a proof of concept stage.** Models based on these tools are often correlational and not causative, and they are primarily used on pricing and underwriting and claims management.

**Big Data Analytics tools enable the development of very accurate assessments, without or with limited human intervention, increasing the efficiency and speed of decision making and therefore reducing operational costs.** However, any biases inherent in the historic data will be reinforced through machine learning algorithms if firms don't have adequate governance arrangements in place. This issue becomes more significant where certain judgements of a (black box) algorithms cannot be specifically explained in a meaningful way.

**Cloud computing services, which reportedly represent a key enabler of agility and data analytics, are already used by 33% of insurance firms, with a further 32% saying they**

will be moving to the cloud over the next 3 years. Data security and consumer protection are key concerns of this outsourcing activity.

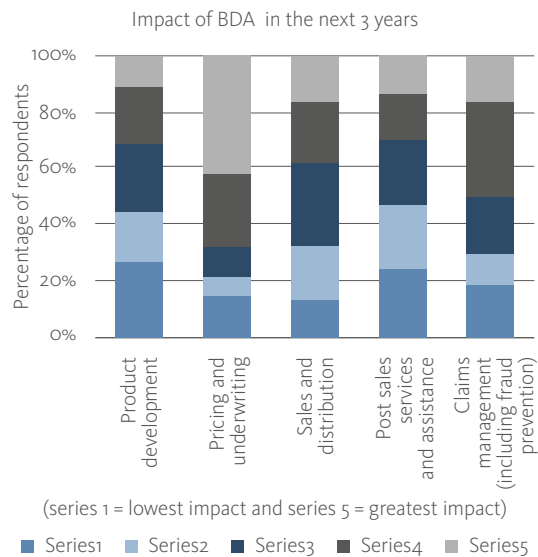
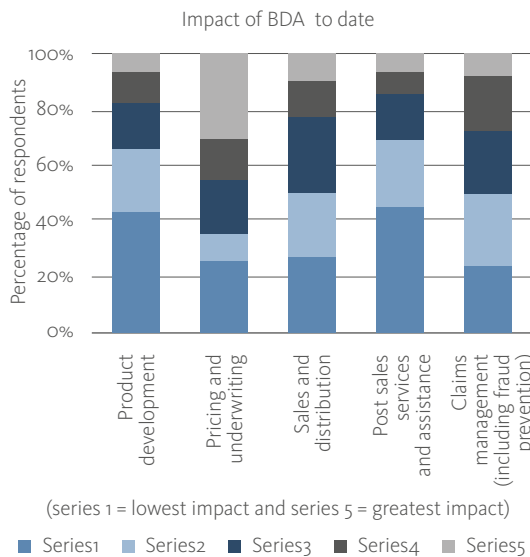
### USAGE OF BIG DATA ANALYTICS TOOLS SUCH AS ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING



## BIG DATA ANALYTICS AND THE INSURANCE VALUE CHAIN

**Big Data analytics are increasingly used across the value chain.** Models based on these tools are primarily used on pricing, underwriting, claims management and sales distribution.

### IMPACT OF BDA ACROSS THE INSURANCE VALUE CHAIN



**Firms have developed sophisticated customer relationship management (CRM) systems where all the information available about their customers is integrated** into a single platform to support sales management (e.g. "Next Best Action" approach). Robo-advisors and specially chatbots are also gaining momentum within consumer product and service journeys.

**The majority of firms already use Big Data Analytics at some stage of the claims management journey;** it is currently used most often in enhanced fraud analytics, followed by automated payment processes, segmentation of claims and invoice verification.

**Big Data Analytics enable the development of enhance risk assessments and new rating factors,** leading to smaller risk pools and a larger number of them. Most rating factors have a causal link while others are perceived as being a proxy for other risk factors or wealth / price elasticity of demand. There is no evidence as yet that an increasing granularity of risk assessments is causing exclusion issues for high-risk consumers, although firms expect the impact of Big Data Analytics to increase in the years to come.

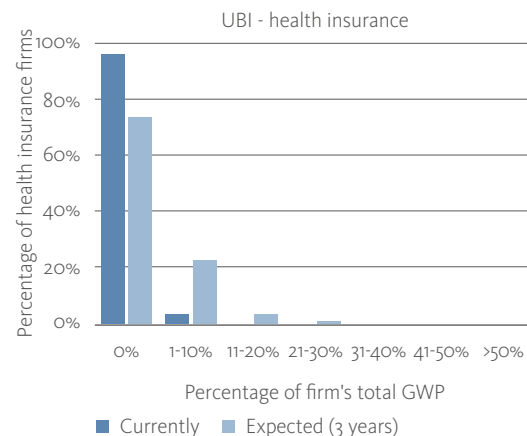
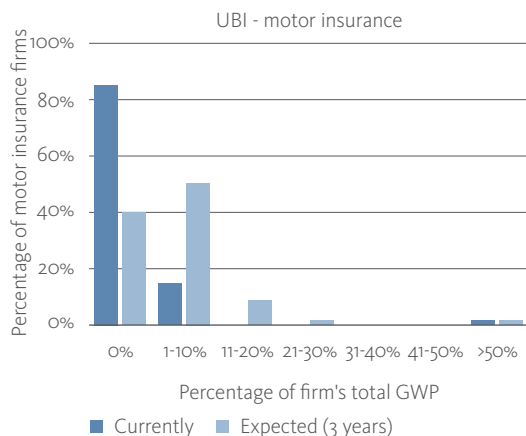
## USAGE OF BIG DATA ANALYTICS ACROSS THE VALUE CHAIN

Product design and development	Pricing and underwriting	Sales and distribution	Post-sale services and assistance	Claims management
<ul style="list-style-type: none"> <li>Usage-based insurance products</li> <li>Tailor-made product and services</li> <li>New products (e.g. cyber insurance)</li> <li>Predictive modelling of disease development patterns</li> </ul>	<ul style="list-style-type: none"> <li>Enhanced risk assessments</li> <li>New rating factors</li> <li>New claims drivers and predictive models</li> <li>Price optimisation practices</li> <li>Churn models</li> </ul>	<ul style="list-style-type: none"> <li>Automated advice</li> <li>Disintermediation of sales processes</li> <li>Sophisticated customer relationship management (CRM) systems</li> <li>Increased frequency and customer interaction: "Next best action"</li> </ul>	<ul style="list-style-type: none"> <li>Smartphone applications</li> <li>24/7 service, accessible from any location</li> <li>Chatbots</li> <li>Safety warnings in case of flood, storm, hail, etc. based on geolocation data</li> </ul>	<ul style="list-style-type: none"> <li>Enhanced fraud analytics</li> <li>Optical character recognition (OCR) to estimate repair costs from images or videos</li> <li>Automated segmentation of claims by type and complexity</li> <li>Automated invoice verification and payment process</li> </ul>

## TELEMATICS IN INSURANCE

Up take of usage-based insurance products will gradually continue in the following years, influenced by developments such as increasingly connected cars, health wearable devices or the introduction of 5G mobile technology. While the use of telematics is commonly associated with pricing insurance policies, firms also use them to offer a wide range of services to consumers.

### PENETRATION OF UBI PRODUCTS IN MOTOR AND HEALTH INSURANCE



### TYPES OF TELEMATICS DEVICES USED IN MOTOR AND HEALTH INSURANCE

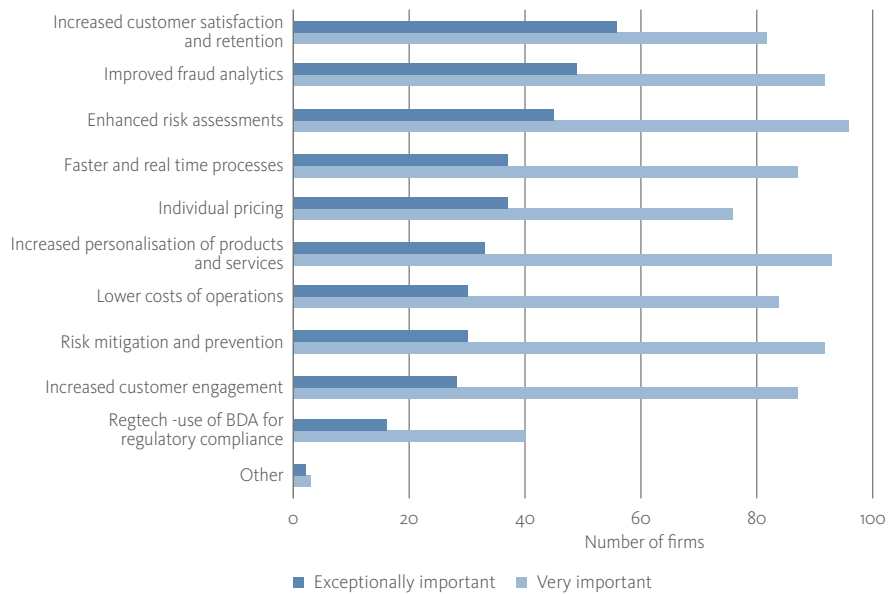
Line of business	Type of telematics device	Type of data collected (depends on the telematics device)	Types of services offered (depends on the telematics device)
<b>Motor insurance</b>	On board device (OBD) dongle or "black box", mobile phone app, GPS, emergency message plug, forward facing cameras ("dash cams")	Average speed, maximum speed, acceleration and braking habits (G-forces), geolocation, distance travelled, time of travel (e.g. day or night), number of journeys, crash reports, battery and engine condition, cornering, lane changes	<p><b>Risk mitigation and prevention:</b> premium discounts based on driving habits, preventive push-notifications or alerts (e.g. black-spot roads or bad weather conditions or battery and engine breakdown problems), travel statistics reports, driving coach recommendations, treats and vouchers for good driving behaviour</p> <p><b>Assistance:</b> road assistance in case of accident or car theft, emergency call in case of accident (ecall)</p>
<b>Health insurance</b>	Wearable bracelets and other fitness trackers, mobile phone app, smart watch	Heart beat rate, blood pressure, blood oxygen level, activity data (e.g. sports or step counter), hours of sleep, geolocation, food and water consumption, calorie consumption, glucose level.	<p><b>Risk mitigation and prevention:</b> rewards for healthy habits, health activity reports, diabetes management</p> <p><b>Assistance:</b> medical assistance services in case of accident, safety alarm for elderly (e.g. BDA tools can predict falls from anomalies in usage/activity patterns)</p>

## CONCLUSIONS AND NEXT STEPS

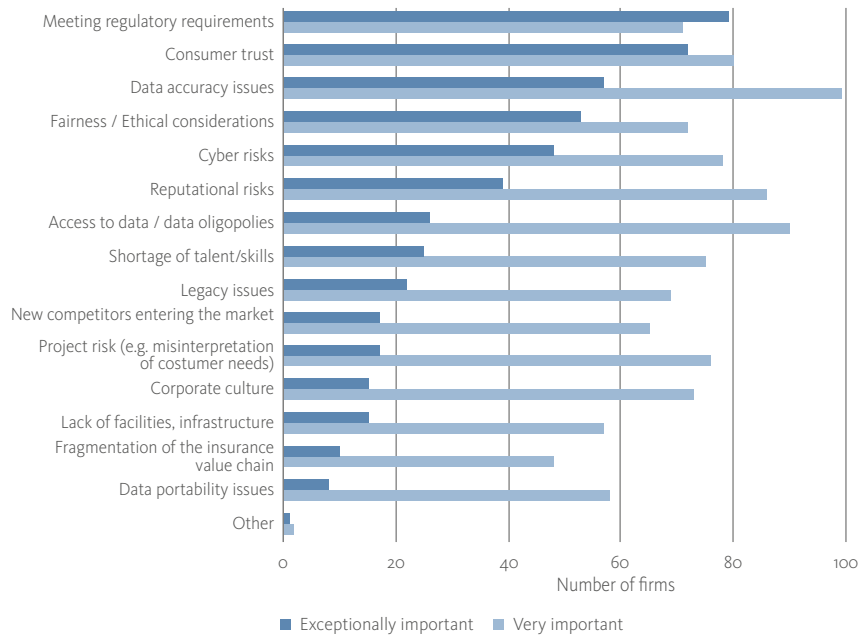
In view of the evidence gathered from the different stakeholders, **EIOPA considers that there are many opportunities arising for Big Data Analytics, both for the insurance industry as well as for consumers.** However, and although insurance firms generally already have in place or are developing sound data governance arrangements, there are also risks arising from Big Data Analytics that need to be further addressed in practice. Some of these risks are not new, but their significance is amplified in the context of Big Data Analytics. This is particularly the case regarding ethical issues with the fairness of the use of Big Data Analytics, as well as regarding the accuracy, transparency, auditability, and explainability of certain Big Data Analytics tools such as artificial intelligence and machine learning.

**In 2019 EIOPA's InsurTech Task Force will conduct further work in these two key areas in collaboration with the industry, academia, consumer associations and other relevant stakeholders.** The work being developed on artificial intelligence by the Joint Committee of the ESAs as well as in other international fora will also be taken into account. In addition, EIOPA will explore third-party data vendor issues, including transparency in the use of rating factors in the context of the EU-US insurance dialogue. Furthermore, EIOPA will develop guidelines on the use of cloud computing by insurance firms and will start a new workstream assessing new business models and ecosystems arising from InsurTech. EIOPA will also continue its on-going work in the area of cyber insurance and cyber security risks.

### BDA OPPORTUNITIES ACCORDING TO INSURANCE FIRMS



### BDA CHALLENGES ACCORDING TO INSURANCE FIRMS



## LEARN MORE



Read the full report Big Data Analytics in motor and health insurance: A thematic review at <https://europa.eu/!Hm68Yr>

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