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Innovation and Technology

InsurTech: A Guide for the Actuarial Community

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InsurTech: A Guide for the Actuarial Community

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InsurTech: A Guide for the Actuarial Community

Background and Executive Summary

With the ongoing emergence of InsurTech, which is a combination of modern technology applications and insurance operations, many traditional insurance companies are looking to further invest in developing their own internal technology infrastructure and/or startup ventures. This report is intended to serve as a guide to the InsurTech landscape for the actuarial community and insurance practitioners.

InsurTech has a variety of operational applications, including risk assessment and selection systems, online and smartphone applications for distribution, underwriting, policy processing and claim adjudication, and the use of big data, artificial intelligence, and machine learning. Section 1 of this report serves as a primer on the InsurTech landscape and provides background on the history of InsurTech, the insurance value chain and the different technologies in use in the InsurTech space — providing a framework and information on the fundamentals of InsurTech to guide further research or discussions within the actuarial community.

Section 2 explores the many opportunities in InsurTech. The rapid increase in funding points to continued growth. Some key drivers of this growth include technology trends in the life and health sector, such as wearable devices, digital customer experiences, technology supporting analytics and automation.

Finally, Section 3 summarizes our findings from conversations with practitioners in the InsurTech space. We interviewed those in actuarial and non-actuarial roles and asked for their perspectives on how actuaries can position themselves in the growing InsurTech space. These practitioners saw the broad insurance industry knowledge of actuaries as something that could bring significant value to the InsurTech space. There is the potential for actuaries to serve as the bridge between the InsurTech industry and traditional insurers or serve as industry experts within InsurTech firms. However, they cautioned that the InsurTech industry may not inherently see this value and it must be demonstrated and proven to ensure actuaries have a place in the growing InsurTech landscape. We cover the challenges not commonly found in the traditional actuarial space and how the SOA and actuaries can create more opportunities for actuaries in InsurTech.

Section 1: What is InsurTech?

1.1 INSURTECH DEFINITION

Technology and the innovation it enables are embedded in our everyday lives. As people have become increasingly comfortable making payment transactions and managing their lives on the internet and on mobile devices, consumers expect to have the same digital experience with regard to insurance.

The digital experience transformation in insurance is only part of the revolution that InsurTech is bringing about. In actuarial circles, “data science,” “big data” and “AI” (including machine learning methods such as deep learning) started as buzzwords. Now, the idea of leveraging non-traditional data and advanced analytics is widely accepted and seen as an integral part of InsurTech.

Moreover, 2020 has been another milestone year for many InsurTech startups, notwithstanding the global COVID-19 pandemic. Some went public, some have announced their IPO plans for 2021, and some were acquired by major insurance players or technology providers. (Of course, many were unable to secure adequate funding or customers and folded.) According to Willis Towers Watson[1], in 2020, global annual InsurTech startup funding reached an all-time high of U.S. $7.1 billion, recording 377 deals. Compared with 2019, total funding increased by 12%, while deals increased by 20%. (See Appendix A for a complete list of global Life and Health InsurTech startup funding transactions in 2020 for reference.)

So, what exactly is InsurTech?

InsurTech is the use of emerging hardware, software and user interfaces to address inefficiencies or opportunities in the insurance value chain. It often involves technology, data and analytics. It targets the evolution/disruption of (a) the interaction between insurers and their customers, (b) the automation of processes, and (c) the modification of old/creation of new insurance products.[2]

This is a broad definition as many companies can label themselves as InsurTech if they do business in **insur**ance with modern **tech**nology. Consequently, there is often a debate as to how to define InsurTech. Does it mean the insurance startups in Silicon Valley? How about an incumbent insurance company that provides a digital experience to its customers? Or can a technology company that provides services to a wide range of industries, including insurance, be categorized as InsurTech?

“InsurTech” is often used in the context of “InsurTech startups,” but it should be more than just startups – it can represent an “ecosystem of focused, innovation-based companies”[3]. Starting with a pool of companies that “do business in insurance with modern technology,” we can bring some perspective to the definition of InsurTech as the intersection of two dimensions: industry specificity and maturity. At one end of the industry specificity dimension, technology solutions can be applied from a “generalist” approach across multiple industries, and at the other end of the dimension, there is a focus on a specific insurance product. For the maturity dimension, we see companies from early stage startups to incumbents that have provided or leveraged technology solutions for decades.

This report will put more focus on more insurance-specific and lower-maturity players in the market (mainly early-stage insurance startups). Defining what can be categorized as InsurTech is difficult, and we do not intend to make an assertion in this report; however, we want to narrow down our focus for this report to shed light on the current InsurTech landscape and help actuarial practitioners understand the career opportunities related to the development of InsurTech. In addition, examples and references in this report are drawn from both global and U.S.-based sources with a focus in the U.S. market.

1.2 INSURTECH HISTORY

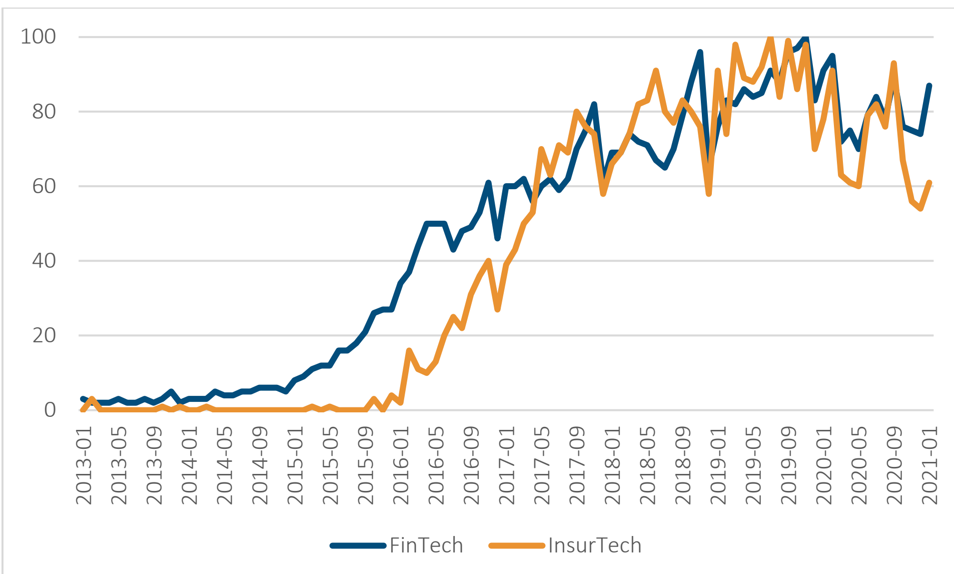
1.2.1 From FinTech to InsurTech

To understand the history of InsurTech, let's take a step back to look at how FinTech emerged. Initially, InsurTech was categorized as part of FinTech until activities within the insurance industry became notable and distinct enough to spinoff from FinTech and become considered its own "category."

FinTech was one of the first and best-known members of "EverythingTech" – a family of "-Tech" terminologies christened from the internet. It is a portmanteau of "Financial" and "Technology," and describes the boom in technology innovations in the financial services industry that started in the early 2000s and gained significant traction from around 2014, according to Google Trend report.[4]

The emergence of InsurTech[5] has been similar – only with a two-year lag based on internet search interest.

Figure 1
2013-2021 GLOBAL GOOGLE TREND – INTEREST OVER TIME



Numbers represent search interest for the given time globally. A value of 100 is the peak popularity for the term. A value of 50 means that the term is half as popular. A score of 0 means there was not enough interest for this term.

1.2.2 Pre-InsurTech

For FinTech, technology-driven innovations such as PayPal and online banking emerged even before FinTech became a recognized term, and the same has been true in InsurTech.

Looking back, companies like Progressive[6] and Esurance[7] started to offer insurance online during Web 1.0 (from roughly 1991 to 2004), the first stage of the World Wide Web's revolution.[8] At the same time, companies began to leverage analytics with large insurance datasets for various applications, often involving the actuarial community. Property and Casualty (P&C) carriers started to leverage predictive modeling in the 2000s[9]. Life and Health (L&H) carriers picked up the trend soon after[10]. For example, in a survey published by the Society of Actuaries (SOA) Committee on Life Insurance Mortality and Underwriting Surveys in 2012[11], about 50% of the participants were considering using predictive modeling for at least one application.

In commentary on the life insurance industry, National Association of Insurance Commissioners' (NAIC) research in 2013[12] described the industry specifically as having "a rich history of adopting and innovating through information technology. It was among the first to widely use computers and fully digital data and document management processes. The industry has also been at the forefront of employing cutting-edge financial and risk modeling technology and implementing state-of-the-art enterprise systems." The research also highlighted what was lacking – "life insurers have lagged behind their financial services counterparts in the use of the Internet and social media to market directly to consumers."

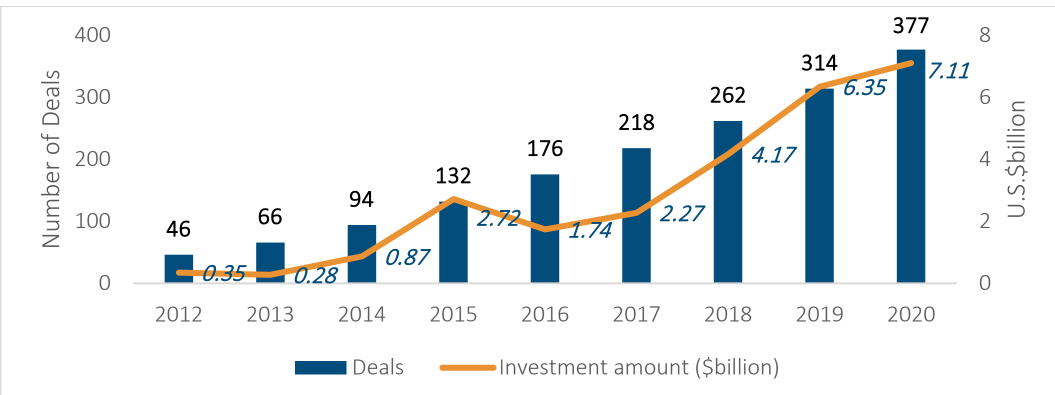
1.2.3 Emergence of InsurTech

The use of the term "InsurTech" started in the early 2010s and was widely adopted from 2015. We can explore and understand the rapid subsequent growth in InsurTech through the lenses of a few different measures: historical InsurTech funding trends; the establishment of various InsurTech-focused incubators and accelerators; and InsurTech-related partnerships for incumbent companies.

Based on Willis Towers Watson's fourth quarter 2020 Quarterly InsurTech Briefing[13], the global funding of InsurTech startups has grown dramatically since 2012 from $348 million to $7.1 billion in 2020, and the number of deals increased by over 700% from 46 in 2012 to 377 in 2020 (see Figure 2).

Figure 2

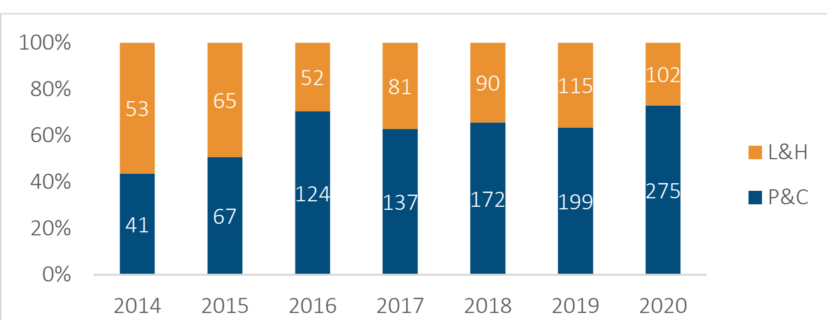
GLOBAL FUNDING OF INSURTECH STARTUPS



The same report also breaks down the number of deals of InsurTech startups by line of business (Figure 3). Interestingly, in the first couple years, the number of deals showed more balance between P&C and L&H; since then, investments have been more concentrated in the P&C sector, from ~40% in 2014 to ~70% in 2020. Further breakdown into Life and Health sectors proved to be a challenge based on our public research since many L&H-focused technology can be shared between both sectors.

Figure 3

NUMBER OF INSURTECH FUNDING DEALS BY LINE OF BUSINESS: 2014-2020



Incubators, accelerators and venture funds have all been active as InsurTech sponsors and investors. Table 1 provides a summary of major U.S. InsurTech incubators, accelerators and ventures sponsored by L&H incumbents across the U.S. Complementing incumbent corporate venture capital organizations, many influential startup ecosystems were founded beginning around 2014, roughly when the Google trend report suggests the term "InsurTech" took off on the internet. In a 2021 interview, Plug and Play, one of the major accelerators on the list below, attributed the reasons for adding a specific InsurTech track to its accelerator program in 2016 to the rapid growth of the track, the scale of the opportunity from a previously archaic industry, early momentum through the success of several InsurTech startups and the increasing number of top talents that was attracted to this area.

Table 1

SUMMARY OF THE MAJOR INSURTECH INCUBATORS, ACCELERATORS AND VENTURES

Name	Type	Location	Founded
Kaiser Permanente Ventures	Venture Capital	California	1997
New York Life Ventures	Venture Capital	New York	2012
Global Insurance Accelerator	Accelerator	Iowa	2014
Transamerica Ventures	Venture Capital	New York	2014
MassMutual Ventures	Venture Capital	Massachusetts	2014
Silicon Valley Insurance Accelerator	Accelerator	California	2016
Allianz Life Ventures	Venture Capital	Minnesota	2016
Plug and Play	Accelerator	California and New York	2016*
FinTech Innovation Lab	Accelerator	New York	2017*
Hartford InsurTech Hub	Accelerator	Connecticut	2018
MetLife Digital Accelerator	Accelerator	North Carolina	2018
OnRamp Insurance Accelerator	Accelerator	Minnesota	2018
Nassau Re/Imagine	Incubator	New York	2019
InsurTechNY	Accelerator	New York	2019
PruVen Capital (Prudential backed)	Venture Capital	California	2020

*Adding InsurTech track

More and more incumbents started to get involved through working with InsurTech startups directly to accelerate internal technology transformation and create additional revenue. Research by LIMRA[14] on insurance accelerators described several ways to get involved in this emerging area of interest:

1. **FinTech/InsurTech-events**: Industry events that provide companies the platform to share their challenges with the startup community
2. **Mentoring**: Working with startups and providing them with industry insight and company-specific challenges
3. **Sponsorships:** Working with incubators and accelerators to gain front-row access to startups in their ecosystem
4. **Pilots**: Running a pilot program that provides a relatively low-risk testing environment to iterate startup solutions
5. **Financial investment:** Investing in startups directly which provides access to innovative solutions and potential investment yield

1.2.4 InsurTech's Rapid Growth

The insurance industry has often been depicted as "traditional" and "slow moving," perhaps, in part, because of its long history dating back to when the first life insurance company, the Presbyterian Ministers Fund[15], was established in Pennsylvania more than 260 years ago in 1759. There are other factors that also help explain the inherent conservatism of the insurance industry that had dampened/limited innovation historically:

- **Customer:** Insurance is sometimes required by law or is a necessity due to the cost associated with the risks – from the cost of rebuilding a property and the expensive medical bills and lawyer fees, to the loss of income from unfortunate events. In the life insurance industry, many policies are long-term policies that last for decades. Customer experience often took a backseat when competing with other priorities such as distribution, profitability or regulatory compliance.
- **Distribution:** Agents and brokers have been the main insurance distribution channels, slowing down the move to digital insurance distribution despite the rise in online shopping in the past decade. According to LIMRA data[16], life insurance distribution has not changed much in the past decade. In both the 2010 and 2019 studies, 89% of the market share was distributed by independent and affiliated agents, while the direct channel, which includes internet sales, increased by just 2%, from 4% to 6%. There is a lot to unpack on the long history of the agent/broker model, and some believe that the complexity of certain insurance products and the need to educate customers are prime contributors.
- **Regulation.** As in many markets, the insurance industry is highly regulated in the U.S., especially for consumer insurance products. Adopting new technologies and innovations typically comes with a lot of regulatory scrutiny and red tape. (Note that examples of regulatory challenges facing the non-U.S. markets are not included here since there are many similar or unique challenges in each country.)
  - The regulatory requirements to file all the forms, rates and rules, and sometimes explain companies' products, pricing and underwriting strategies in the U.S., disincentivized carriers to innovate due to the limitations in regulatory approved analytics methodologies and the relatively low barrier for competitors to replicate and catch up.
  - Anti-rebating regulation[17] introduced by the U.S. regulators is another barrier to innovation as modern and customer-centric marketing in the era of InsurTech often focuses on additional benefits to customers beyond what a typical insurance policy covers. Running sweepstakes or raffles and donating to charity for policies sold for building the brand and customer loyalty, providing free connected devices (e.g., fitness trackers, home sensors) to encourage risk mitigation and provide access to further data, are all controversial examples related to the anti-rebating laws. These topics sparked debates and conversations between innovators and regulators to find solutions and clarity in regulation language, and we expect to see new debates and conversations when the next creative idea emerges.
- **Technology.** Legacy systems in many insurance companies introduce additional barriers/impediments to innovations, which often require the adoption of modern technologies. According to The State of Application Development 2019 report by OutSystems[18], 79% of insurance firms have application development backlogs, and only 36% say they're improving. CB Insights[19] shed light on some of the root causes:
  - Insurance leaders tended to see technology as a cost center rather than a strategic opportunity due to the fact that executive positions mainly came from the main functions, such as underwriting and claims, while the IT department reported to finance or operations executives rather than to the CEO.

- Insurance was one of the first industries to use mainframe computers to build proprietary systems in the 1950s and these systems became outdated in the 21st century. Some companies are still saddled with legacy systems since the effort to rebuild can be very difficult and costly.

These are compelling reasons. So, what has caused the shift in the last decade that has made technology innovation one of the hottest topics in the industry? One reason is that people began to see the early successes of companies that adopted technology innovation, and of startups, without the hindrance of legacy systems, that delivered improved customer experience and faster, streamlined processes.

Let's go back to the four big areas that we listed above and explore the reasons behind the shift a bit more deeply.

Customer

Customers' expectations of insurers have been shaped by their experiences outside of insurance. In some respects, it's customer expectations that are pulling insurers along, based on what they have come to expect from the likes of tech giants (Amazon, Apple, Facebook, Google and Microsoft). Accenture's 2021 global Insurance Consumer Study[20] provides some insights into what modern insurance customers expect from carriers:

- More insurance customers, especially millennials, are more open to digital offerings, from purchasing policies and making claims, to added services to make them safer and healthier.
- Consumers are accepting more personalized offerings associated with their habits and usage by exchanging personal data with insurers.
- Customers value the freedom to choose from any method of interaction (e.g., in-person, phone call, email or virtual chat) and the key for insurers is to achieve "the right balance between digital and human interaction" as "insurance can be an emotionally complex business for consumers."

A report by Bain & Company[21], based on its Bain/Research Now Insurance NPS Survey conducted in 2018, discussed three broad areas that insurers should focus on to meet the increasing expectations:

1. **Excel in their core business** – high quality, competitive price, and simple and digital customer propositions
2. **Go beyond insurance** – create an ecosystem of interconnected services (see Table 2)

Table 2
ECOSYSTEM OF INTERCONNECTED SERVICES

Life and Health	Auto	Home
• Health diagnostics • Healthy living advice • Treatment • Senior citizen support • Financial planning	• Purchase and sale • Safe driving • Emergency support • Lifestyle on the road	• Purchase and sale • Home security • Energy management • Emergency support • Comfort

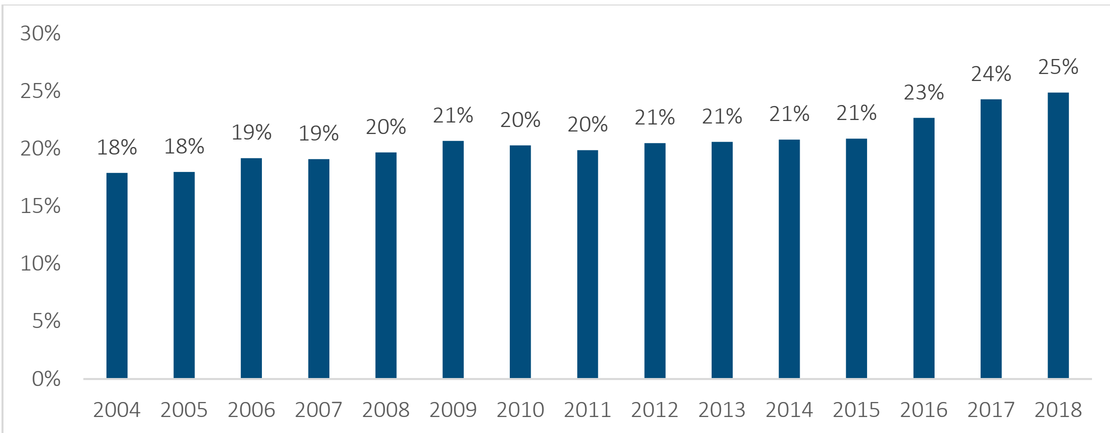
3. **Innovation** – understand the urgency and the need to innovate with a customer-focused mindset.

Distribution

Distribution is expensive. Traditional distribution channels where agents and brokers play a central role in acquiring customers contribute to much higher expense ratios that directly affect profitability. The top 30 global carriers experienced a seven-point increase in acquisition costs between 2004 and 2018, from 18% to 25%, according to Insurance Journal.[22]

Figure 4

TOP 30 GLOBAL CARRIERS ACQUISITION COST RATIO BY YEAR



With improving customer experience as the main driving factor, many are forecasting a continuing shift from traditional distribution channels to digital and direct distribution. Some have argued that digital and direct distribution lowers the overall expense via the elimination of agent commission; however, it is often replaced by similar or sometimes even higher cost in marketing and customer acquisition costs. An industry report published by McKinsey & Company[23] on insurance distribution global trends and forecasts stated that, even though the insurance industry is currently dominated by agents and brokers, direct channels have experienced faster growth and increased share. Current trends suggest a pronounced shift toward an approach that includes both traditional intermediary and direct channels in the coming years.

Regulators (and Rating Agencies)

Some U.S. insurance regulators have been embracing and encouraging change.

- The NAIC created the Innovation and Technology Task Force in 2017 to "provide a forum for regulator education and discussion of innovation and technology in the insurance sector, to monitor technology developments that affect the state insurance regulatory framework, and to develop regulatory guidance, as appropriate."[24]
- On the topic of anti-rebate laws, many states have considered exceptions in order to strike the right balance between protecting consumers and fostering innovation.
- Regulators also became more willing to interact and have open conversations with the industry by participating in industry events. For example, Plug and Play has a recurring event called "Bridge the Gap"[25] that invites regulators, startups, and insurance companies to discuss regulations, InsurTech and innovation.

Pressure from rating agencies has also helped to accelerate InsurTech development. Given incumbent insurance companies' growing interests, in March 2020, A.M. Best released a "Scoring and Assessing

Innovation"[26] rating criteria procedure and a revised credit rating methodology. This further encouraged incumbent companies to look for investments and partnerships in the InsurTech space.

As mentioned earlier, international examples are not cited here due to the uniqueness of regulations in each country.

Technology

Many InsurTech startups provide solutions to enable incumbent insurance companies to lower cost, increase speed to market and/or better serve their customers. As mentioned earlier, legacy systems create roadblocks, requiring incumbents to evaluate the cost-benefit of switching to a more modern infrastructure. Sometimes, the advantages can outweigh the undertaking of the transition, especially in the current fast changing and competitive environment.

While a full system transition can be enormous, expensive and disruptive, there are companies that provide application programming interfaces (APIs) for integration between legacy systems and modern solutions, which can serve as a stepping stone. This allows insurers to benefit from modern technologies more quickly and less expensively, further accelerating the speed of adopting the emerging InsurTech innovations.

1.3 INSURTECH ACROSS THE INSURANCE VALUE CHAIN

InsurTech can play a role in many different areas along the insurance value chain. The 2019 Willis Towers Watson Quarterly Briefings categorized four functional areas and provided some insight into InsurTech's role in each:

1. **Pricing and underwriting**[27]

Pricing and underwriting are the core functions where actuaries play critical roles. Some specific examples of how InsurTech can be influential include:

- Data enrichment, customer journey analytics and IoT (Internet of Things)
  - Leveraging new and multiple external data sources, including more granular data from the IoT devices to empower analytics and gain accurate insights of the risks and customer behaviors
  - Enabling a "no questions asked" or "few questions asked" fast and automated customer insurance purchase experience
- Pricing and underwriting sophistication
  - Automated artificial intelligence (AI) platforms that make advanced analytics more accessible for accurate and targeted pricing and underwriting
  - The use of data enrichment and better internal data management to create more accurate pricing and analytics-backed underwriting strategies, such as decline rules, manual intervention and application fraud detection
- Convenient, personalized insurance
  - Supporting the creation of customizable and customer-centric products
- Speed and automation
  - Supporting the entire process of pricing and underwriting from analysis to decision-making to deployment

2. **Quote, bind, issue**[28]

There are many technologies that can support the end-to-end customer acquisition process. Each component requires a different focus from InsurTech:

- **Quote**: enabling a fast and hassle-free quoting process, increasing price discovery through insurance aggregators (third-party websites that combine the premiums of a group of agents or companies) /price comparison services, and providing pricing transparency to customers, agents, brokers and underwriters,
- **Bind**: speeding up the process of binding by automating the process and embedding governance and verification to reduce human error or fraud, and
- **Issue**: issuing digital contracts from systems and creating policy records immediately after binding.

3. **Policy administration and central systems**[29]

Legacy systems are a big barrier to innovation for insurance companies. InsurTech can provide modern systems that:

- Fulfill customers' needs which have been evolving across the board,
- Support data-driven management system and business strategies,
- Provide support to corporate functions such as legal and actuarial to distributing insurance efficiently, and
- Provide speed and agility in deploying rates, rules and models to the front-end systems.

4. **Claims and settlement**[30]

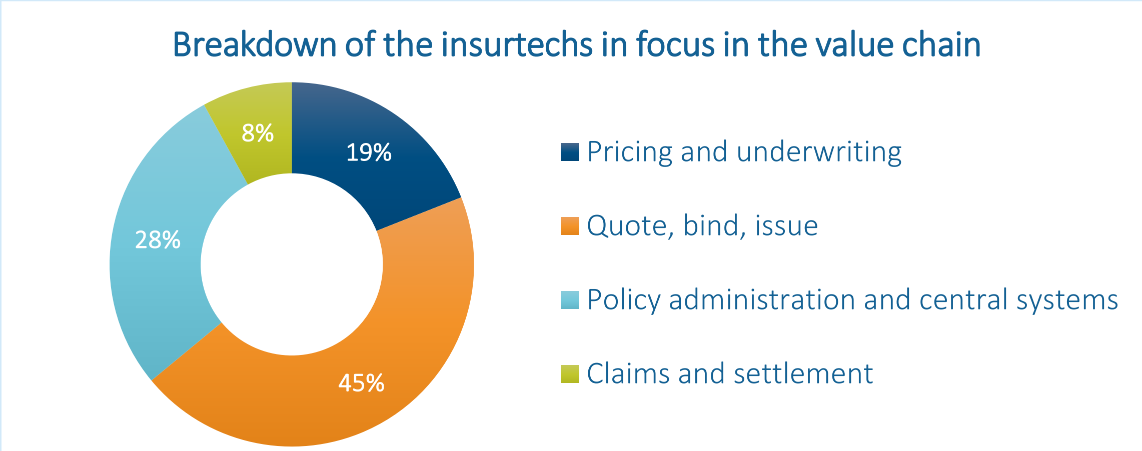
InsurTech can enable a digital, streamlined and transparent claims and settlement process. This is critical to the customer experience, especially since filing a claim is often related to unexpected and stressful life events.

Another important takeaway from a more automated, smart and integrated claims process is valuable insights for pricing, underwriting, capital allocation and forecasting. Some benefits include:

- Digital claims and settlement management to engage customers through the whole process and reduce delays,
- Claims process automation to reduce manual work and increase processing efficiency and accuracy, and
- Enhanced fraud detection through advanced analytics and new data sources.

Based on Willis Towers Watson's 2019 internal research , 760 InsurTech companies fit into these four areas, with a strong focus on the quote, bind and issue area as this is a natural first interaction between policyholders and insurance companies that results in direct revenue.

Figure 5
BREAKDOWN OF THE INSURTECHS IN THE VALUE CHAIN



1.3.1 Innovation: Disruption Vs. Enabling

There has been considerable debate about the extent to which InsurTech will disrupt the insurance industry. Willis Towers Watson describes disruption as "displacing an existing market, industry, or technology and produces something new and more efficient and worthwhile. It is at once destructive and creative."[31]

InsurTech includes both disruptors and enablers, with a prevailing emphasis among startups on finding ways to partner with incumbents to drive improvements, although there certainly remain a subset of startups focused squarely on disruption. From a survey[32] conducted by Willis Towers Watson in 2018, InsurTech investors were asked to characterize the goal of their investments: "9% said disrupting the value chain, 30% said disintermediating customers from incumbents, and 61% said enabling the value chain." This dynamic was also highlighted in the comparison between PwC global CEO surveys conducted in 2018 and 2019: "We've shifted toward collaboration, as both startups and legacy providers realize that they gain from combining the former's technology with the latter's customer knowledge and understanding of risks and capital strength."[33]

1.4 TECHNOLOGIES IN INSURTECH

Technology is the core of InsurTech. Below is a list of common technologies and technology trends underpinning InsurTech that are shaping the industry.

1.4.1 Data, Analytics and AI

Technologies	Descriptions
Technologies providing broader access to data	Common examples are: • Data privacy and security: data encryption, cyber risk monitoring, synthetic data, automation of the detection and safekeeping/securing/removal of sensitive information • New data sources: geospatial, connected devices, location intelligence and social media
Data ingestion	Enables the extraction of structured, semi-structured and unstructured data from documents into usable formats for underwriting, claims, analytics and other functions. This category often includes various techniques mentioned in this list, such as machine learning, computer vision or NLP (natural language processing).
Machine learning techniques	Machine learning is the study of algorithms that can improve and adapt to new data and experience automatically. It helps to find patterns in large volumes of data more efficiently with minimum human intervention. Deep learning, a term that has been gaining popularity, is a branch of the machine learning techniques.
NLP	Supports the understanding of natural language (e.g., speech or text) and processes it to carry out more sophisticated tasks.
Computer vision	Understands digital images and videos, and processes and interprets them similar to how a human does.

1.4.2 Connected Device, IOT (Internet of Things)

Technologies	Descriptions
Sensors and software that can connect with other devices and systems via the internet	Common examples are: • Smart home devices: Some common devices used by InsurTech include smart fire, CO^2 or security alarms, smart water sensors, and infrared sensors (used to identify when an elderly person falls) • Wearable trackers: Enable digital fitness and biometrics tracking and real time data • Telematics: Telematics devices or apps track mileage and driving behavior There are other emerging trends in the use of connected devices, such as smart factories or sensors that monitor weather events such as flood and earthquake.

1.4.3 Digital and Virtual Customer Engagement

Technologies	Descriptions
Technologies enabling digital customer experience	Common examples are: • Many InsurTech companies focus on providing easy integrations with digital platforms to incumbent insurance companies to lower the barrier of digital customer experience transformation • Insurance aggregators that connect to multiple carriers for customers, agents and brokers to receive quotes with a single application entry.
Technologies providing virtual customer services	Some example techniques include video conferencing, image/video recognition, chatbot or speech to text

1.4.4 Enterprise, Cyber and Security

Technologies	Descriptions
RPA (Robotic Process Automation)	Provides technology to replicate and automate repetitive manual operational tasks that can be determined by a set of rules.
Technologies enabling "Big Data"	Extremely large datasets, such as real time telematics data or social media data that can be presented in structured or unstructured (e.g., images, videos, social media/IOT data) formats, require different technologies and data strategies than managing traditional insurance datasets. For example, data warehouses/data lakes, large data volume processing and analyzing (cloud computing) and data security and privacy are critical to using big data for analytics.
Mobile solutions and 5G, cloud, high performance computers	Infrastructure to support all the technologies used in InsurTech is reaching another level of maturity thanks to innovations such as 5G, high speed internet and cheaper and faster cloud solutions.
Immersive technologies	XR (Extended Reality) technology leverages computers and wearables to generate interactions between humans and machines by incorporating real and virtual environments. In the InsurTech space, some companies are using XR technology to train claims adjusters or to immerse customer service representatives in "real life" scenarios.

Among the actuarial community, the most widely known technologies from the list are big data and AI, but it is important to recognize how other emerging technologies play their roles in the InsurTech space, and the technologies are continually being updated.

1.5 INSURTECH PLAYERS

1.5.1 Who Are They?

While this report has a focus on early-stage players with a more targeted focus on the insurance industry when we describe the landscape and trends in the space, we want to further emphasize that the word "InsurTech" is not synonymous with "insurance startup". We see InsurTech as the phenomenon of the transformation happening in the insurance industry, not just a certain group of companies. We see the following players that actively engage in the InsurTech space:

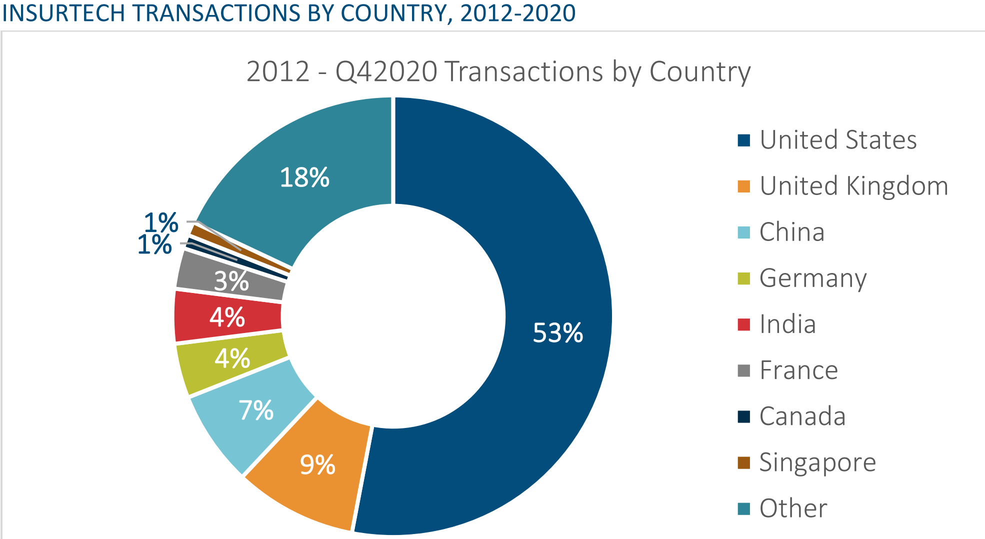
InsurTech Players	Description
Startups	They are either selling insurance or providing value-added technology solutions to insurance companies.
Incubators, accelerators and ventures	They form an ecosystem for the early-stage players to gain funding and other supports to develop and refine their solutions.
Incumbent carriers	Many insurers, especially the ones with more resources to invest and defined innovation strategies, engage in InsurTech through partnering and investing in InsurTech companies and/or creating and empowering innovations in house.

1.5.2 Where Are They?

The emergence of InsurTech startups is not confined to Silicon Valley. We see InsurTech investment activities across the globe and in different states within the U.S. While more than half of all InsurTech investment transactions still take place in the U.S. (primary InsurTech hubs are in California and New York, and we have seen growth of hubs in other cities such as Hartford, Columbus and Des Moines), markets in Europe and Asia also have significant activity (see Figure 6).

Figure 6

INSURTECH TRANSACTIONS BY COUNTRY, 2012-2020



* Private technology investments by (re)insurers by country – Willis Towers Watson Q4 2020 Quarterly InsurTech Briefing[34]

Section 2: Opportunities in InsurTech

2.1 MESSAGE TO ACTUARIES

Most agree that InsurTech is no longer just another buzz word, but an accelerating industry trend that will play a major role in how the insurance industry will develop in the future.

Actuaries are already playing a variety of roles in insurance organizations – InsurTech brings new opportunities to further expand the actuarial footprint. They can not only join InsurTech startups and bring our actuarial background into innovation and entrepreneurship, but also participate in testing new innovations and partnering with InsurTech startups within the InsurTech ecosystem.

Actuaries can and should position themselves as leaders and experts in the InsurTech space. Based on our interviews with practitioners in the InsurTech space, actuaries have some core strengths:

- Broad understanding of the business from actuarial training and work experience provides value to both technical and non-technical roles
- Self-learning ability through years of exam studying and continuing education requirements in the credential process helps actuaries to learn and apply new concepts in a rapidly-changing environment
- The emphasis on ethics and actuarial professionalism is also valued in the InsurTech space.

However, actuaries need to address some common challenges:

- Effective communication is important, not just to InsurTech roles, but also traditional actuarial roles – however, there is a greater need in the InsurTech space due to the greater variety of stakeholders involved.
- Actuaries are associated with the inherently conservative and risk-adverse culture and this creates a barrier since the InsurTech culture can be almost seen as the complete opposite.
- Additional technical and business skills outside of the traditional actuarial wheelhouse can be another challenge for actuaries to expand or pivot their job description.

In Section 3, we cover our conversations with practitioners in the InsurTech space. We will discuss these topics in more detail and briefly go through some of the challenges not commonly found in the traditional actuarial space and how the SOA and actuaries can create more opportunities for actuaries in InsurTech.

2.2 CURRENT OPPORTUNITIES

2.2.1 InsurTech Funding

According to Willis Towers Watson's Q4 2020 Quarterly InsurTech Briefing, "Global InsurTech investment continued to grow amid a tumultuous year. In 2020, total annual InsurTech funding reached an all-time high of U.S.$7.1 billion, inking 377 deals — the highest in any year to date. Compared with 2019, total funding increased by 12% while deal volume increased by 20%." In Q4 2020 specifically, "later-stage companies — including Hippo, Unqork, Waterdrop, Oscar Health, Bind Benefits and Newfront Insurance — each received in excess of the U.S.$100-million-dollar 'mega-round' funding mark, creating six mega-rounds for the quarter. These six rounds combined totaled U.S.$1.1 billion in funding."

The significant investment entering InsurTech startups shows the continued and increasing interest in the area and presents a significant opportunity for those who are interested in joining the new venture world.

However, it is important for actuaries to understand the risks and the landscape outside of the stable insurance carrier world. As we mentioned above, actuaries can still participate in a less risky way by working on the other side of the table through working for carriers testing and partnering within the InsurTech ecosystem.

2.2.2 InsurTech Trends

Understanding the current and emerging InsurTech trends is critical when assessing the opportunities in InsurTech. While sources vary, here are several commonly mentioned themes:

1. **Technologies in L&H sectors**

   Leveraging data for underwriting the risks and providing risk mitigation.

   - Wearable and biometric devices

     The use of such devices in everyday life provides many benefits to the insurance industry, especially given the low cost of the technology. Companies reward proactive insureds and reduce/mitigate long-term risks by providing vitality-type programs to policyholders. The data points (e.g., steps, calories, sleep patterns, heartrates, glucose levels) from these devices can also be used for underwriting. Some InsurTech companies provide solutions to ingest various wearable data for insurance companies to use for underwriting directly.

   - Data intelligence on available life and health records

     Insurance companies can leverage existing data to understand how hospitals and diseases are affecting the policyholders of L&H insurance via hospitals and Electronic Health Records (EHRs) held by third-party vendors. InsurTech companies can help to simplify the effort to augment, standardize and understand various data sources, and provide technologies to enhance data privacy and security such as synthetic data.

   - Genetic data

     Genomics offers insurance companies more insights about mortality, such as disease susceptibility and other genetic predispositions, and connects demographic and behavioral data (what is the probability of an event to a person through aging and exposure to certain environments). InsurTech companies can perform genomic reviews and help insurance companies to understand the risk profile of an insurance application. (The research paper "A Primer on Insurance Policies and Genetics[35] provides some background on this topic.)

2. **Digital customer experience**

   Digitalization is, and will continue be, at the forefront of the insurance industry transformation and modernization. The increasing number of managing general agent (MGA) InsurTech startups demonstrates how InsurTech can tackle customer engagement through digital experience by working with incumbent insurance companies. It is not just about purchasing insurance online, but the end-to-end digital experience from the purchase of insurance, the premium payments and claims filing, to value-added services that improve customer engagement.

   Another important aspect of digital play is the consumer-facing applications that provide cross-selling opportunities for insurance partnerships.

3. **Technologies to breakthrough challenges in implementing analytics**

   According to Willis Towers Watson's 2020 Life Insurance Predictive Analytics Survey of 40 global life, accident and health (re)insurers, although predictive analytics is important and provides positive business impact, there are six top challenges in implementation:

   (1) Data volume, quality and reliability

   (2) Data capture and availability

   (3) Infrastructure and data warehouse constraints

   (4) IT, information service bottlenecks, lack of coordination

   (5) Data accessibility, not easily integrated

   (6) General Data Protection Regulation (GDPR)

   InsurTech companies that enable more sophisticated analytics and help companies to tackle issues around data, infrastructure and regulation are valued and will continue to play important roles.

4. **Automation of everything – including underwriting, claims, billing and internal processes**

   There can be many benefits to automation, including lower manual workload and errors, enhanced customer experience and lower expenses. These are big incentives for insurance companies to continue to invest in automation.

These points aside, COVID-19 and the current economy might have further accelerated InsurTech development. At the very least, the current environment provides an opportunity for the industry to reflect on what changes are needed. What do customers really need? What technologies and innovations can provide true value? Capgemini's World InsurTech Report 2020[36] suggested that customer engagement, resilient processes, real-time crisis response, intuitive customer care, and digital experience are the key areas of focus for insurers. While it is hard to predict how the insurance industry will shape up after the pandemic, it seems likely that technology innovations are going to play an even more important role in the future.

2.3 LESSONS FROM INSURTECH CASE STUDES

We often celebrate and put focus on the success stories, and those success stories indeed helped advance the transformation of "buzz" to "reality" in InsurTech. Truth be told, for entrepreneurs and innovators, entering and succeeding in InsurTech is not always easy. The reasons behind successes and failures cannot be easily summarized as there is no one-size-fits-all way to explore this topic. In this section, we discuss at a high level some of the reasons that contributed to successful startups and companies adopting innovations, the needs for pivoting in InsurTech (and startups in general) and the reasons why InsurTech is not always "sunshine and roses."

2.3.1 Successful InsurTech

So, what are the common success criteria? There is no uniform way to measure success and how companies get there.

For startups, the key to success can be complicated. An article published on Daily Fintech website[37] by Stephen Goldstein attempted to use a formula to explain the main criteria:

InsurTech Success = (customer experience + dollars and cents + compliance + applicable technology)^team

- Customer experience: What part of the customer (policyholder/B2B customers) experience are you trying to make better?
- Dollars and cents: Does the solution help to increase sales and/or reduce costs?
- Compliance: Do regulatory limitations impact the solution or does the solution address the legal barrier?
- Applicable technology: What is the right technology to meet the goals and needs?
- Team: Is there a solid, well-rounded team of talent?

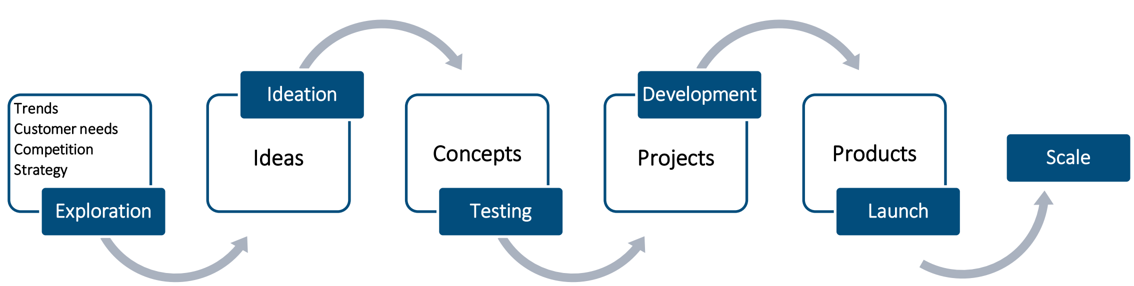
For incumbents, innovation through in-house research or partnership is often more complicated because they may face more barriers with legacy technology, corporate hierarchy and cultural conflict. They also have advantages, such as financial support and resources that startups often lack, including treasure troves of in-house data and insurance knowledge.

According to an article written by BCG InsurTech experts[38], "relationships between InsurTechs and incumbents might be undermined by some of their intrinsic traits," and "successful collaborations are based on a set of core principles – people, technology, and business – to guarantee long-term success, including, but not limited to, alignment of vision and values, knowledge sharing and continuous learning, mutual adoption of new technologies, and set up of customer-centric operational frameworks."

2.3.2 Pivoting[39]

Pivoting is often essential to innovation. Willis Towers Watson describes innovation in six stages: exploration, ideation, testing, development, launch and scale. Throughout the entire journey, it is important to go back to the drawing board quickly when something does not work.

Figure 7
SIX INNOVATION STAGES, WILLIS TOWERS WATSON



Startups usually have limited resources. The ability to find the right idea and right business model to achieve scale and profit in a short timeframe is critical.

Below are some examples in the market of how startups have pivoted in an attempt to ensure a more successful future:

- Some of them transitioned from a Business-to-Consumer (B2C) model to a Business-to-Business (B2B) model

  In the B2C market, competition can be very intense and it often requires a lot of capital investment to reach everyday customers. But technologies are not segmented by B2C or B2B and several companies have been able to successfully pivot to serve enterprise customers through either serving the commercial insurance market or focusing on the technologies in which they excelled the most to partner with insurance companies.

  For example, the initial business model for one startup was selling property telematics (home sensors) to consumers directly before pivoting to focus on P&C insurers as its primary distribution channel. P&C insurance companies have strong incentives to provide such devices to their policyholders to mitigate losses and enhance customer engagement and retention.

- Product proposition

  Product ideas and underlying technologies can be used for multiple product propositions. Sometimes, market reactions can cause a startup's pivot to focus on a different product use case.

  One example would be a startup focused on selling life insurance to a niche market – those who participate in high-risk adventure sports. Through market research, they found that their target customers did not want to think about dying as their life insurance product suggested. They pivoted by providing subscription accident and injury insurance instead, with a focus on the same underserved market segment.

- Disruptor to enabler

  Both disruptors and enablers exist in InsurTech, though more investors are focusing on the "enabler" segment. We observed that many disruptor startups concluded the funding opportunities were greater by pivoting to enable the incumbents.

  For example, an on-demand auto InsurTech startup became known for disrupting the industry with one of the first pay-by-mile products in the market. It led the on-demand market through years of data aggregation and technology advancement. Through accepting investments from an incumbent company, they provided their AI and smartphone technology to assist the incumbent to shorten their claims process from two to three weeks to same-day payouts.

2.3.3 Learning from Setbacks

According to Willis Towers Watson's internal research[40], between 2017-2019, approximately 184 funded InsurTech companies closed. Andrew Johnston, Global Head of Willis Re InsurTech, commented that "InsurTechs operating in obscurity have very short shelf lives if the capital injected at an early level fails to support commercial germination." A report on startup failure rate by failory.com[41] shows that, in general, 90% of all startups fail.

CB Insights has summarized 20 reasons why general startups have failed[42], their top five reasons being:

1. **No market need.** The right product that provides a scalable solution is critical for startups, and some generated insufficient customer interest and did not pivot fast enough to survive.
2. **Ran out of cash.** "Runway" in startup terminology refers to how long the business can operate before it runs out of money. Keeping a sustainable runway and having the ability to continue to raise funds and/or generate positive cash flow are important for early-stage companies.
3. **Not the right team.** Creating a diverse team can provide the right balance of skill sets, knowledge, and focus, especially at an early stage when startups need to create the right MVP (minimum viable product) under funding stress.
4. **Get outcompeted.** InsurTech space is getting more and more crowded, and CB Insights often sees similar companies and technologies in the market, especially ones that address prevailing trends. Startups need to set the right strategy to survive.
5. **Pricing/cost issues:** InsurTech startups need to find a price point that can attract customers and cover expenses. It can be difficult during the early stages, when acquisition cost is higher and the expenses associated with innovative technology can be high, to be sustainable.

For insurance companies, partnering with InsurTech can also be challenging. To quote from Accenture's November 2017 report on InsurTech: "While many insurers are already active in this area – in having well-defined innovation agendas or running their own incubators, for example – they can sometimes find their programs are not delivering as much value as they might. Other insurers are yet to take any substantive action at all, and do not even know their own innovation approach, let alone how to collaborate with the myriad new partners and technologies flooding the industry."[43]

Deloitte's 2019 report on Accelerating Insurance Innovation in the Age of InsurTech[44] summarized some of the organizational challenges that can contribute to failures:

- Siloed organizational structures can inhibit innovation because of a lack of connectivity among innovation entities and business leadership.
- Innovation leaders often lack resources and authority.
- There is a lack of entrepreneurial talent to spearhead and implement more ambitious innovation efforts.

The inherent risk of entrepreneurship should be evaluated when actuaries are looking at InsurTech opportunities. Actuaries provide value to the innovations in insurance based on what we learned from our conversations with practitioners, but to what extent and how they can influence the success of a new venture are not questions that can be easily answered.

Section 3: Conversations with Practitioners in the InsurTech Space

3.1 ACTUARIAL OPPORTUNITIES IN INSURTECH

InsurTech offers many opportunities for interested actuaries. Beyond that, as InsurTech reshapes the insurance landscape, it is important for actuaries to be involved in the movement that will determine the future of the insurance industry.

Actuaries and non-actuaries alike believe the technology-based innovation being introduced now will change how insurance operates in the U.S. and globally. As we've seen in the prior sections, InsurTech can impact many operational aspects of insurance, and the increased interest and investment over time suggests that InsurTech influence on the insurance industry will continue to grow. Actuaries have established themselves as critical to the traditional insurance model; it is equally important that actuaries not stand on the sidelines as the industry moves into the next era of insurance.

Although we defined InsurTech rather narrowly for this paper, we think of the potential role of actuaries as expansive. We include any roles that help bring new technology-based innovation to the insurance industry, from running a startup to being employed at a traditional insurance company and ushering in new technology-based innovation and everything in between.

To help illuminate the opportunities for actuaries in InsurTech, we interviewed 11 practitioners currently involved in the InsurTech space. To give a broad representation of views, those interviewed included actuaries and non-actuaries working at startups and innovation labs within tradition insurance companies, and people working on propositions across the insurance value chain. A list of interviewees can be found in Section 4. We provide quotes from those interviews here. These quotes have been edited to improve readability and preserve anonymity of the interviewee. The primary focus of these edits was removing company names or indicators or adding the topic (e.g., "actuaries" or "InsurTech"), which would have been clear from conversation but may not have been apparent in isolation for the section excerpted for the quote. We do not believe these edits impact the intended message of the interviewees.

Broadly speaking, actuaries working in the InsurTech space see myriad opportunities. The InsurTech space views actuaries as a key connection between traditional insurance and InsurTech companies. This ability to connect insurance experts and non-insurance entrepreneurs is driven by fundamental knowledge and skills that actuaries already have. Actuaries understand the full breadth of an insurance product. Their training and experience gives them expertise in core functions such as product development, pricing, reserving and profit analysis. Actuaries also have a firm understanding of underwriting, distribution, insurance regulation, policy administration and the processes of insurance.

- "Actuaries can be the bridge between InsurTech and traditional insurance. Actuaries speak the language of other actuaries that InsurTech has to encounter."
- "As the person who could speak the language of traditional insurance, I ended up having to constantly negotiate between the carrier and the innovation lab."
- "Actuaries understand end-to-end insurance."
- "My corporate actuarial background gave a strong appreciation of how the mechanics of a policy work and tie to the financials. I was expected to be a source of information for everything related to insurance…as actuaries, I think we are very well versed in insurance."
- "Actuaries have the insurance basic training and business domain knowledge, as well as a broader view of the objectives."

Non-actuaries agree with this concept.

- “We value insurance industry experience. Understanding how a product works and how risk is assessed is the core. The backbone behind any insurance product is risk and assessment. An actuary to me, and why they are so important, is they are the footing around the house.”
- “I need someone that can take the insurance black box and translate the box over to my InsurTech company.”
- “As actuaries, you are taking specialized knowledge to translate it to non-actuary speech.”

While actuaries’ broad knowledge base brings critical insurance expertise that InsurTech entrepreneurs may lack, it can also work against them. Many in InsurTech see themselves as disrupting traditional insurance and actuaries are perceived by some in InsurTech as being the embodiment of traditional insurance and big corporations. As such, the actuary’s role and reputation of being an integral part of the established insurance industry can be seen as a negative. Additionally, they are perceived as being resistant to the change that InsurTech seeks to bring to the space.

- “We have a challenge to not be seen as jaded or discounting ideas out of hand because it’s never happened or been done before.”
- “We bring in the tech and the actuaries say they don’t have enough data and I can’t do anything there so the answer is ‘no’. Actuaries do not think outside of the box as much, do not leverage approaches and solutions outside of insurance.”

Furthermore, since many InsurTech companies are not issuing insurance products, they don’t have a need for actuaries from a regulatory perspective, such as opining on reserves. Though actuaries can add value in other capacities, InsurTech companies may not see the need to employ actuaries. This view may shift as more InsurTech companies move towards issuing their own products.

- “A lot of these InsurTechs are not insurance companies, they are other entities in the ecosystem. They have less of a need for actuaries that they perceive. Actuaries are required when you are putting out insurance products, actuaries are required for valuation.”
- “Most of these InsurTech companies think of themselves as software delivery companies and not as insurance delivery companies. You don’t really need the actuaries; instead, you want the software developers. You just need enough of the actuaries to help the software developers.”
- “We are a pure tech company. There are no active actuaries employed at our InsurTech. We are technically not the creator of any product.”

Accordingly, actuaries will need to demonstrate their value as knowledgeable, analytic business people. They will also need to separate themselves from the perception that their entrenchment within the current insurance space hinders their ability to contribute to innovation.

- “InsurTech might not value actuaries or even know anything about actuaries. You need to show that you are dynamic and you can build things. Many InsurTechs may not inherently see the value of actuaries; you may have to pitch your own job.”

3.2 ACTUARIAL STRENGTHS IN INSURTECH ROLES

Our conversations highlighted some disconnects between the actuaries we spoke to who saw a broader place for actuaries in InsurTech, and some non-actuaries who tended to have a more limited view of the actuarial opportunities. Both parties agreed, however, that actuaries have broad and credible insurance knowledge. Actuaries and some non-actuaries expounded on these and other strengths that could help actuaries provide value in the InsurTech space.

The actuary's broad business understanding may allow them to serve effectively in technical and non-technical roles from IT to sales. In technical roles, actuaries are seen as offering a different value proposition from data scientists or software engineers.

- "Data scientists may not fully understand the applications of findings or data trends, an actuary can bring the 'why' and applications of the findings."
- "Data science talent isn't really building any insurance industry-specific knowledge, they are not getting involved in understanding some of the regulation that drives why products are the way they are or the economics."
- "Software developers frequently encounter issues and don't know how to make effective decisions. They don't have a foundation in how the insurance industry works."
- "Data scientists pull together great information, but can't tell if they can use the information and be compliant in a state. This is something an actuary would be aware of."

In technical roles, many felt that the actuarial offering was not to be a better data scientist or software engineer, but to focus on the unique perspective that the actuarial background provides. This includes translating data into meaningful insurance-related insights.

- "Actuaries do not need to compete with data scientists but need to know how to work with them"
- "I don't think of us as data scientists. We've missed the boat on being data scientists. But we can be data-driven decision makers, which is a very different role than data scientist. Actuaries are some of the best talents at figuring out that space between the model, data and analysis, and translating that into decisions and the business."
- "The data scientist is better at data engineering, but the actuary is better at analyzing the results of the data."

In non-technical roles, actuaries also excel based on their broad understanding of the business of insurance, as well as regulations. This can quickly add value to decisions from claims, underwriting, marketing or innovation, to interfacing technologies with existing insurance company infrastructures.

- "Actuaries can serve in technical and non-technical roles from IT to sales. They can be the voice of the customer side – claims, products, underwriting, customer experience, and also can do technical roles such as leading data scientists."
- "Opportunities that specifically leverage the actuarial skill set are in the policy administration sphere, to say that more broadly, consumer engagement, managing the financials of the policies, inforce management, working with technology that is driving people to be healthier and defining the value of that to the insurance company. Actuaries have a lot of components and places they can work within InsurTech."
- "Opportunities exist in business development roles. Actuaries are going to be much better suited to selling InsurTech products to insurance companies than anyone else because they are not only going to understand the financials or what drives the insurance industry, but they may also be able to look at your internal data at the company and find ways that show that you can look at that value internally."

- "Actuaries understand regulatory constraints on how to use data, privacy issues, regulatory differences by states, etc. which provide value to InsurTech."

Of note is that, among the sample of actuaries with whom we spoke, several had held broad management or "executive-level" roles, including CEO, founder or co-founder, and other roles outside of traditional product development and pricing.

Another strength of actuaries in an environment that focuses on applying new concepts is the emphasis on self-learning embedded in their credential process. This experience demonstrates the actuary's ability to quickly pick up new skills.

- "Actuaries have the ability to learn honed through the exam process and like to challenge themselves."
- "Actuaries are efficient at studying, allowing them to pick up new knowledge quickly."

Finally, actuaries bring professionalism and ethics. In the same way that actuarial credentials open doors and create opportunities for actuaries throughout the traditional insurance industry, their credentials also hold some weight in the InsurTech space.

- "Professionalism and core ethical standards are most undervalued amongst us as actuaries. If you compare yourself to a data scientist, software developers or things like that, they are not professions, they are careers. We are legally a profession; we have legal standards which make us a profession and our ethical requirements as a profession have value and costs. We should sell the value."
- "Just by virtue of the amount of information we have to memorize and learn in the exams, I think we do come in with a lot of credibility."
- "An actuary is so educated and dynamic, in my opinion, from a mathematics standpoint and the professionalism. It's a certification that is quite dynamic."

In short, while the actuarial skill set can add a lot of value, there are challenges (real and perceived) that need to be addressed in order to create more opportunities in the InsurTech space.

3.3 ACTUARIAL CHALLENGES IN INSURTECH ROLES

Our interviews also addressed potential challenges actuaries face in integrating into the InsurTech landscape. One example is communication skills. Non-actuaries were more likely to perceive actuaries' communication skills as a hurdle, whereas the actuaries we interviewed believe this view of actuaries as ineffectual communicators is an outdated stereotype.

- "Communication is huge. You're going to be communicating with a CEO in one minute, and then a software engineer, and then an investor. You need a very strong ability to tailor your communication and the level of detail."
- "Communication is important, we have to communicate effectively, but don't necessarily have to be the greatest communicators in the world."
- "The communication aspect is important - being able to communicate effectively to people who don't have all the industry knowledge and expertise; not using all the acronyms and getting it down to plain English, but also explaining the complexities of the whys and the hows; and understanding and communicating both the high level of the business plus the details."
- "Actuaries need to get out and talk to people. This is maybe not something a lot of actuaries are good at, but they also need to be able to talk to non-actuaries and see how they can benefit the company as a whole, not just look at everything from a purely actuarial perspective."

Another challenge is that actuaries are closely associated with the inherently conservative cultures of many long-established organizations, which are viewed as incompatible with the InsurTech culture characterized by creativity, embrace of disruption and fast-paced decision-making.

- “Actuarial methods are backward looking, especially in experience studies, but it only works well in stable and mature environments. Some actuaries are in the industry for longer and have become ingrained with how things work traditionally.”
- “InsurTech entrepreneurs that come into a space feel that you don’t need the experts from that space and actuaries can be seen as those experts. These are the people who have been in the industry a long time and they’re experts in it. InsurTech entrepreneurs don’t necessarily want to go to those people because they are biased to the industry and they want to bring fresh ideas to this.”
- “Insurance companies aren’t doing innovative things, so actuaries aren’t getting skills designing new products or thinking out of the box.”
- “Actuaries may be perfectionist, where InsurTech is the wild west. We must merge the highly regulated/studied with the startup ideal.”
- “A challenge was negotiating a traditional insurance company’s conservatism with an InsurTech startup’s aggressive goals, this is a very common dynamic between InsurTechs and large carriers.”

In part because of these perceived cultural differences, actuaries are sometimes seen as being resistant to new ideas and innovation.

- “Actuaries are viewed as narrow in scope and experience, less willing to change. We are actually ‘skeptical till we are not’ through learning quickly and asking questions, then moving to support ideas, but outsiders might think we are not interested in changing.”
- “There is a level of sentiment that actuaries and lawyers are more ‘no people’ than ‘yes people’. No one wants them in the room that early for talks about a new product or something that is unproven.”
- “Actuaries should ask how and not just dismiss; there isn’t data but our business is understanding risks.”
- “Actuaries like rules and consistency but there is a need to be more creative.”
- “Actuaries need to be flexible and dynamic, which is against the methodical style of the traditional actuaries.”

Despite one of the actuarial strengths being broad insurance knowledge, several interviewees still view actuaries as having a limited skill set and experience.

- “InsurTech startups see actuaries as the finance person that works with mortality tables. Actuaries are pigeonholed to just evaluation and other typical actuarial roles but actuaries can do a lot more.”
- “Actuaries are so pigeonholed that people ignore their opinions on other subjects such as underwriting.”
- “I don’t see a lot of actuaries in executive roles; they haven’t been taught the skills.”

3.4 INNOVATING IN DIFFERENT INSURTECH SPACES

Several interviewees noted that there are different challenges specific to where in the InsurTech landscape an actuary may be engaged. An actuary at an innovation lab within a traditional InsurTech will have some different concerns than an actuary at a startup.

The startup InsurTech environment presents its own unique challenges, for example, in relation to understanding the funding cycle and venture capital structures to the accelerated timelines and product development cycles.

- "Actuaries have an understanding in financials which is great for early stage startups when venture capital funding is important."
- "A challenge I faced was understanding the investor world. I also had to learn to value a company from a personal compensation/equity perspective and to understand what metrics were important and to communicate to a venture capitalist."
- "At a typical insurance company, if you take a year to launch a product and you take another week to get it done, it's not that big of a cost. If you are delivering things rapidly, that week can be very costly to the company."
- "As an actuary, we tend to want to get things right and take the time for perfection. If you are moving really quickly, you can't. Or, putting it another way, there is a monetary and opportunity cost to the time it takes for perfection. Sometimes we sit and say what is going to be our distribution of pricing cells, but one way to find out is to start selling something and see. That's a different way of thinking, finding the balance between risk management and prevention in advance vs. we can get this out here and learn and put monitors and controls in place."

For those working in innovation labs within traditional insurance firms, the close ties to the parent companies create additional stability, but the relationship may also have cons.

- "I've never once done funding rounds or investor pitches; for others, it's a big part of the job. We can spend all of our time on the technology."
- "A pro is that we naturally have a big first client, a con is struggling with competitive disadvantages related to conservatism of the traditional insurance firm."
- "We don't get the benefit of interacting with a lot of different companies and seeing the different benefits of our technology and different challenges companies may be having."
- "Innovation labs present the real opportunities to sandbox and play with different solutions and understand how to get involved without adverse impact to the company."
- "It is a trend that incumbents are doing stuff in-house, but it often takes longer than startups because the hierarchy structure in insurance organizations doesn't have the internal structure to innovate as they think they do."

Additionally, the innovation cycle itself presents challenges. Many InsurTech firms or innovation ideas encounter the need to pivot multiple times, evolving and changing products and purpose, sometimes very quickly. We specifically solicited feedback from those in the InsurTech space who have had to pivot and find success in products or ideas that were not part of their original vision. Many felt the driver of knowing when to pivot was being able to constantly reassess your ideas and being open to other ways of thought.

- "Diversity of thought in insurance companies right now means let's get the accountant, marketing department, and someone in sales — it's limited by the current business model. What diversity really looks like is 'who have we never spoken to?' 'Is there someone in the room who can shock us?'"

- “To know when to pivot, realize you are looking at things in an automatic way, you need to get someone who will say ‘stop looking at this and look at that, it’s amazing’.”
- “Innovation is driven by listening to what the landscape is telling us and pivoting to its need and direction. In the insurance corporate setting, you don’t have a lot of connection with the customer. That’s why we don’t see a lot of insurance innovation, as we’ve standardized the whole concept of insurance.”

3.5 SOCIETY OF ACTUARIES CURRICULUM AND INSURTECH

As noted, the majority of interviewees thought that one of an actuary’s core strengths is their broad understanding of insurance, which not only reflects the value of the SOA curriculum, but also the experience actuaries gain working at traditional insurance companies and actuarial consulting firms.

Elements of the SOA curriculum and traditional actuarial roles that are seen as having prepared actuaries for successful moves into InsurTech include:

- “The SOA education in basic finance, upper-level exams with core insurance skill sets, business understanding and communication are strengths of the SOA curriculum.”
- “The breadth of topics you are exposed to is really valuable.”
- “The SOA, while late to the game, did a good job of adding predictive analytics to the curriculum. They’ve done a good job of having the sections talk about InsurTech and doing plug and play and trying to connect actuaries to the industry.”
- “The general insurance track creates more opportunities since some InsurTech products can be positioned between P&C and L&H.”

Areas of opportunity that may assist in further preparing actuaries for roles (or helping to create opportunities) in InsurTech include:

- “Include opportunities in the curriculum to learn the InsurTech landscape, what they do, what they offer, being able to quickly assess what value an InsurTech could provide to a company and how you could think about that value.”
- “Have software, basic core software knowledge being a part of our curriculum. If you think of the successful STEM-related industries, everyone goes through a core where they learn the tools for their trade. Software needs to be a more core component of what we expect actuaries to be knowledgeable on. I don’t mean that you need to be a software developer. I mean that you have to understand how the internet works, understand what the cloud is; understand that there is a technology stack and understand the different components of the technology. We have a professional responsibility to understand these things. Insurance is being sold on the internet now, how does that impact the things that we sell. How does that impact our assumption development?”
- “I would like to see more behavioral economics readings and thought leadership from that industry in the actuarial profession. Getting some of our actuaries to understand the social psychology and behavioral aspects of the customer, of humans. This is the number one thing that is the driver of thinking differently and innovation.”
- “Our professional development is actuaries teaching other actuaries. The problem with that is, if you are behind as a profession, it’s hard to catch up. It would be great if the SOA could fund getting external experts who are not actuaries to drive continuing education for actuaries. That’s where the gap is right now. Get a data scientist to come, get someone in marketing.”

- "Technology, automation and understanding the system are valuable knowledge, though you can learn that from other sources quite easily. The SOA isn't best positioned to provide that training, but it is important to provide such information to the community."

In the words of one interviewee, we need our professional development to be "ahead of where technology is taking the insurance industry, where it is taking the world."

3.6 CREATING OPPORTUNITIES IN INSURTECH

The onus is on actuaries to create more opportunities in InsurTech by highlighting their strengths, which may not be immediately apparent for some in InsurTech and addressing the (real and perceived) challenges head on.

Throughout our conversations, actuaries and non-actuaries gave us insight into the types of actuaries that do well in the InsurTech space and the shifts they would like to see in the actuarial mindset to become more effective contributors to InsurTech innovation.

Those in the InsurTech space are looking for actuaries with broad insurance expertise and the following additional skills:

- "We need actuaries who can change their mindset from 'no' to 'this is how we do what you are talking about.'"
- "Open mindedness is probably the most important trait for an actuary. We have to be open to a completely different way of thinking of things and not judge it. Most in the tech world are coming to it with an extreme amount of skepticism about the insurance industry. They see themselves as coming to solve the problem the industry has. If you are closed down to new ideas, it will be hard to engage."
- "We are a tech company that empowers life and annuity companies, that's our company's goal. Anyone, such as actuaries, who can bridge these gaps is very beneficial."
- "When hiring actuaries, we want experience in one of the core actuarial concepts plus something else – really effective communicators or worked in sales and brokerage."
- "We look for specific industry or product knowledge that an actuary gained from working at a company and general broad business knowledge. We have found actuaries seem to go beyond their individual sphere and want to understand the business as a whole and that's really valuable as a startup to have someone that is not just in their little window."
- "Actuaries are extremely good at having data-driven decision-making skills."
- "To stay abreast of innovation, actuaries needs to be more open, listen and then connect with customers and other industries. The learning is not going to come from textbooks."

It is up to actuaries to leverage their strengths and change perceptions in InsurTech. If actuaries are not involved in the innovation underway, they run the risk of losing their prominence as the insurance industry evolves. "We in InsurTech play in pushing the industry into a new area. When you look at what's going to happen in risk, and risk reduction, etc. actuaries should be and would be involved in this. Get actuaries involved in this innovation now. If actuaries don't change their mindset from 'no', they won't exist in these spaces in the future."

Actuaries will also have to broaden their current role in InsurTech: "In the current developments within InsurTech, I see people working on operational efficiency in the current business model. That will immediately pigeonhole actuaries in InsurTech as just experts on the current state of play. Over the long term, InsurTech is trying to imagine a different business model for insurance; the actuary's role is not as clear if the actuary is not willing to think differently. If the actuary wants to be part of that future InsurTech landscape, then humility is important."

To create opportunities, "Actuaries need to realize that InsurTech is a good place to work, and InsurTech needs to understand they need actuaries."

Section 4: Acknowledgments

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Appendix A: Global Life and Health InsurTech Startup Funding Transactions in 2020

Date	Company	Total Funding ($M)	Description
1/8/2020	Summary Medical	0.08	Summary Medical is developing an AI-enabled software service that will summarize documents for the insurance industry.
1/14/2020	Ringmaster	5.00	Ringmaster Technologies provides cloud-based solutions aimed at modernizing the quoting and administration processes for brokers, agencies, third-party administrators, MGUs and carriers of stop loss policies.
1/14/2020	Gentem	3.94	Gentem offers instant claim reimbursements for physicians.
1/17/2020	Pawlicy Advisor	1.10	Pawlicy Advisor is a pet insurance broker that connects pet owners with ideal plan by analyzing options on the market and each pet's breed specific health risks.
1/24/2020	Simply Benefits	0.80	Simply Benefits provides software that allows employees to manage health insurance benefits.
1/28/2020	Justworks	143.00	Justworks provides new businesses with a solution to set up manage and payroll and offer large-company benefits while ensuring legal compliance. The dashboard allows companies to make it easy to fill out forms such as the I-9 and offers direct deposit and processes payments for contractors (a free service), salaried employees and hourly workers. On the platform, companies can also offer full medical, dental and vision coverage and process payments, files required taxes, files for workers comp and handle other legalities for its users.
2/11/2020	Proformex	7.08	Proformex is a life insurance policy management system that ensures life insurance contracts are actively managed each year.
2/12/2020	Careship	11.39	Careship helps families find a home-based caregiver for their loved ones by using a matchmaking algorithm to find qualified personnel, while advising on insurance benefits and coordinating all the moving parts in these arrangements.
2/13/2020	Mutumutu	1.30	Mutumutu is a start-up from Czech Republic that develops a lifestyle-based platform for behavioral life insurance.
2/14/2020	Friday Health Plans	80.68	Friday Health Plans focuses on overall simplicity to offer low prices so more people can afford health insurance
2/18/2020	Emerging Therapy Solutions	9.28	Emerging Therapy Solutions provides analytical software tools and outsourced services to insurance providers and other payers to manage expensive cell and gene therapies.
2/26/2020	Goldfinch Health	0.05	Goldfinch Health helps health care payers, companies and patients navigate surgery and recovery. It aims to lessen the need for opioids by supporting consumers during the disability period and their return to work.
2/27/2020	Anagram	17.93	Anagram provides real-time price transparency and streamlined insurance benefit processing for the purchase of health care services.
2/27/2020	GoHealth	54.80	GoHealth is an online portal for finding health insurance coverage. The company helps consumers compare health insurance quotes and purchase individual coverage online, through agent networks, or directly through a health insurance company
2/28/2020	Nuanwa Technology	13.99	Nuanwa Technology provides health insurance technology services for insurance companies and Internet platforms, including product customization, risk management, underwriting, claims, operation systems, health management and other health insurance technology services.

Date	Company	Total Funding ($M)	Description
3/3/2020	Ladder	103.55	Ladder is a digital life insurance provider.
3/4/2020	Health iPASS	11.28	Health iPASS provides a patient revenue cycle platform that aims to improve the patient experience from appointment to payment by giving providers the tools to simplify the check-in process and streamline time-of-service and residual balance, patient payments.
3/12/2020	PolicyMe	2.45	PolicyMe offers customized and automated advice on life insurance.
3/17/2020	Viveo Health	2.20	Viveo Health combines its telemedicine service with insurance by the company, with very experienced management. It has a cooperation network across Estonia that can help to identify the losses of insurance clients and assist them in self-diagnoses.
3/17/2020	GIGI	0.15	GIGI offers financial solutions for those without ESI/PF benefits, including savings, financial education and more. It also offers health insurance.
3/17/2020	Virgil Insurance	0.15	Virgil Insurance is an online broker that helps seniors buy Medicare-subsidized inpatient, outpatient and prescription drug insurance. It provides a platform that compares the prices of insurance offerings and connects the user with the best offer
3/25/2020	Clareto	4.53	Clareto is a digital health and InsurTech company that seeks to commercialize use cases and pursue market opportunities, with an initial focus on modernizing life insurance underwriting.
3/26/2020	Yixin Technology	12.72	Yixin Technology is an intelligent insurance service provider
4/3/2020	xbAV	51.00	xbAV is a provider of corporate pension technology in Germany. Its SaaS platform provides a shared-service interface between pension product providers, insurance agents, companies and employees to create new, and manage existing, pension policies.
4/3/2020	Catch	13.30	Catch offers a personal benefits platform, offering tax withholding, retirement plans, health insurance and more – all integrated in one place. It serves the people who don’t have access to employer benefits, including freelancers, contractors, gig workers, founders and full-time employees with inadequate benefit plans
4/9/2020	Neosurance	2.34	Neosurance offers AI and machine learning powered solutions for insurance companies to enable the sale of instant micro policies. Through the Neosurance solution, the insurer can send the right insurance offer when the client needs it.
4/10/2020	LIANREN Digital Health	71.10	LIANREN Digital Health is a big data company based in China that focuses on health care data for the insurance, pharmaceutical, clinical and other industries.
4/20/2020	Alan	141.00	Alan is a Paris-based digital health insurance company that develops subscription-based software for insurance with clear pricing and transparent reimbursement policies. Alan is a primary insurer that distributes its own health plans directly to companies and individuals.
4/23/2020	Bestow	68.10	Bestow is a full-stack insurance technology company that builds products and software that make life insurance accessible to millions of families. In addition to its direct-to-consumer arm, Bestow provides industry first APIs enabling partners to offer customized life insurance coverage to their customers.
5/6/2020	Wellth	17.20	Wellth inspires positive behavior change for patients with chronic behavioral and physical health conditions. Powered by a Behavioral Economics engine and intuitive smartphone design, Wellth uses daily

Date	Company	Total Funding ($M)	Description
			financial incentives to overcome patients' Present Bias and motivate them to adhere to their daily care plan
5/12/2020	Burn to Give	4.87	Burn to Give is a digital health and InsurTech company that uses data science and machine learning to automatically track and reward individual good habits with no-cost life insurance coverage and charitable donations
5/12/2020	Zipari	50.20	Zipari develops solutions for carriers to engage with consumers. Powered by consumer analytics, Zipari's insurance-specific CRM and Consumer Experience Platform provide carriers with real-time insights into consumer behavior at every touch point.
5/27/2020	Inclusivity Solutions	2.86	Inclusivity Solutions links distribution partners (e.g., mobile operators), insurance companies and emerging consumers to deliver digital insurance solutions that meet consumer needs, make good business sense and deliver long-term impact. It provides complete solutions, including strategy, product and process design, and implementation support.
5/29/2020	SmartHR	79.80	SmartHR is a crowdsourced personnel management platform. The company automates procedures related to social insurance and unemployment insurance. It was developed to free up managers or human resources representatives from tiresome and time-consuming personnel management.
6/3/2020	Friday Health Plans	80.70	Friday Health Plans focuses on overall simplicity to offer low prices so more people can afford health insurance
6/4/2020	Proformex	10.50	Proformex is a life insurance policy management system that ensures life insurance contracts are actively managed each year.
6/16/2020	HealthCare.com	41.60	HealthCare.com is a search, comparison and recommendation tool for health care consumers. Its visitors can analyze hundreds of health insurance options in their area and get data-rich recommendations to help make smarter decisions about their health plan purchase.
6/23/2020	Apostrophe	16.90	Apostrophe is a health care platform where employers and members can pay a monthly fee to have Apostrophe pay for medical bills upfront at a lower rate than insurance providers.
6/24/2020	Fraudscope	9.07	Fraudscope provides software that gives organizations the tools to quickly identify suspicious claims, collect actionable information and collaborate across the organization to open, investigate and resolve cases quickly. It has specialized solutions for clients handling professional claims, facility waste claims and pharmaceutical fraud schemes.
6/24/2020	Nexben	7.94	Nexben is an open insurance marketplace, helping companies of all sizes simplify the process of buying and selling health insurance.
6/26/2020	Oscar Health	1493	Oscar is a technology-driven, consumer-focused, health insurance company using technology and personalized service to give members transparency into the health care system and empower them to choose quality, affordable care.
6/26/2020	Insurello	11.6	Insurello proactively educates people about their insurances and manages as well as maximizes their claims through a simple digital solution.
6/29/2020	Huizhenbang	0.62	Huizhenbang is a service platform that helps patients find experts and helps primary hospitals with health care, education and research by sending in experts and providing legal, insurance and home visiting services.
7/6/2020	PolicyBazaar	558.78	PolicyBazaar helps users compare financial products like life and general insurance, loans and credit cards. To enable easy and sensible comparison, the company has partnered with financial institutions disbursing loans and

Date	Company	Total Funding ($M)	Description
			selling insurance in India. PolicyBazaar helps get free insurance quotes and users can compare plans based on multiple features.
7/7/2020	Nayya	2.80	Nayya helps employers find the right health insurance coverage plan for their employees, using data to increase transparency and provide cost-saving insights and information around the doctor network nearby.
7/14/2020	PlumHQ	0.93	PlumHQ through its online platform provides employers and employees with customizable health insurance plans, pricing and health care experience.
7/20/2020	Yolo	10.43	Yolo has built a platform that enables consumers to activate micro insurance products in real time and pay-per-use.
7/21/2020	Angle Health	4.00	Angle Health provides health insurance plans and benefits.
7/21/2020	Sift Medical Data	6.10	Sift Medical Data is a health care analytics platform that holistically leverages data sources, both structured and unstructured, to reduce claim denials, increase patient collection rates and capture insights.
7/23/2020	Sidecar Health	38.00	Sidecar Health provides personalized and affordable health insurance for members. Members can see any provider, costs are transparent and plans are cheaper than comparable ACA plans
7/28/2020	Aixuan Technology	2.90	Aixuan Technology is a third-party technology platform that provides big data algorithm, actuarial model, prediction model and more in the application of finance and insurance.
7/29/2020	Covr Financial Technologies	24.50	Covr Financial Technologies is a digital life insurance company that aims to make it easier to research, quote and purchase life insurance.
8/1/2020	Baloon Assurance	2.08	Baloon Assurance is an insurance company intended for the African continent that allows people to subscribe to car and health insurance using a smartphone
8/10/2020	Brella	7.00	Brella (fka Clara or Clara Insurance) is a supplemental health insurance company. It aims to complement a user's health insurance and pays cash if they are diagnosed with any of 13,000+ covered conditions.
8/12/2020	Eden Health	39.00	Eden Health is a health care start-up combining private primary care, telemedicine and personalized insurance navigation in a mobile app.
8/20/2020	Waterdrop	480.25	Waterdrop, also Shuidi Huzhu, is an insurance platform that plans to solve the problem of high medical fees faced by most patients, especially those with a critical illness. When a user is diagnosed with a serious disease like cancer, the platform will crowdfund the medical fees from all of its users.
8/21/2020	BeneFix	10.21	BeneFix is a managed marketplace that automates and optimizes marketing, sales, onboarding, enrollment, ben-admin and servicing.
8/26/2020	Ledger Investing	20.92	Ledger Investing provides an exciting opportunity for asset managers, pension funds, hedge funds, family offices and other institutions interested in earning a great return through insurance investing.
8/26/2020	Breathe Life	12.17	Breathe Life protects families transforming the way personal insurance is bought and sold today. The API-driven Breathe Life Enterprise Commerce Platform uses advanced analytics and AI to unify customer data into a single view of the customer and dispatch leads to the right channel with the right insurance product at the right time. Using the Breathe Life platform, carriers can sell more policies through advisors, direct or anywhere in between.
9/3/2020	Justpoint	1.00	Justpoint uses artificial intelligence for faster analysis of individual medical malpractice claims.

Date	Company	Total Funding ($M)	Description
9/4/2020	Human API	17.39	Human API is a consumer-centric health data network. Human API offers providers an infrastructure they can use to create a health platform that enables a group of patients to share data with their caregivers.
9/7/2020	BIMA	144.20	BIMA provides mobile-delivered insurance to mobile operators and insurance companies. The company also provides product development expertise, a dedicated distribution force, efficient customer service with rapid claims payment and a mobile insurance platform.
9/9/2020	Sana Benefits	27.44	Sana Benefits' software as a service (SaaS) platform provides small-to-medium sized businesses access to benefit plans for their employees.
9/9/2020	Decent	18	Decent offers affordable health insurance for self-employed people. The company has launched in Texas and partnered with major organizations including HCA and Costco.
9/10/2020	i3systems India	2.5	i3systems is an Indian AI start-up specializing in medico-financial data science, helping insurers enhance customer experience and reduce costs.
9/14/2020	Medpay	0.06	Medpay is an AI-powered platform connecting primary health care network to insurers for cashless claims in real time.
9/18/2020	Prenetics	67.65	Prenetics is a genetic testing/digital health company in Southeast Asia. With a simple saliva sample, individuals can discover how their genes affect their diet, drug response, disease and cancer risk.
9/22/2020	Bright Health	1575	Bright Health offers affordable, benefit-driven Individual & Family and Medicare Advantage health insurance plans. Through exclusive partnerships with health systems; affordable health insurance plans; and a simple, friendly approach to technology, the company seeks to improve the way people and physicians achieve better health together.
9/28/2020	Noyo	12	Noyo transforms connections between benefit software and insurance carriers. Noyo offers an API platform for improving the speed and accuracy of health insurance data exchanges.
10/1/2020	Integrity Life of Australia	40.77	Integrity Life of Australia is an insurance group dedicated to making life insurance what it should be.
10/13/2020	DeadHappy	8.45	DeadHappy is an InsurTech company that aims to remove the taboo surrounding death by offering more flexible life insurance policies.
10/14/2020	Osmind	2.2	Osmind wants to use its practice management and monitoring software to help mental health professionals deliver care to at-risk underserved populations. It provides anonymized insights for pharma/insurance companies to ensure that these treatments are effective.
10/21/2020	Nava	20	Nava is a new kind of benefits brokerage on a mission to bring high-quality, affordable health care to all Americans. Built by a cross-functional team of technology, insurance and employee benefits experts, Nava combines modern health care tools, year-round employee advocacy and ongoing measurement to deliver effective plans.
10/21/2020	Groove Health	1.81	Groove Health provides a digital platform for health insurance companies, hospital systems and self-insured employers to improve medication adherence using predictive analytics and personalized patient engagement.
10/21/2020	Bind Benefits	248	Bind delivers a new, condition-first health plan design that creates an intuitive fit between people's health insurance and the way they actually use health care. Through the unique Bind design and experience, users see their treatment options, compare costs, choose the most cost-effective pathway and can add coverage as needs change.

Date	Company	Total Funding ($M)	Description
10/26/2020	Truth4Life	0.3	Truth4Life offers a prepaid debit card with no credit check and up to US$10,000 of life insurance included.
10/28/2020	Fabric Technologies	0.71	Fabric is a digital insurance company that sells life, accident and health insurance products.
11/1/2020	GroMo	0.71	GroMo provides access to financial products such as loans, insurance and investments to the underserved cities through a digitally enabled social commerce model.
11/2/2020	vlot	1.11	vlot is a B2B2C platform opening up an agile and integrated world of risk analysis, coverage and life planning.
11/11/2020	Turaco	3.3	Turaco offers health loans bundled with insurance. It ensures that their clients can get care whenever a medical emergency arises.
11/12/2020	QantEv	1.78	QantEv optimizes provider networks for health insurers.
11/17/2020	ArthurAI	18.3	ArthurAI partners with the companies in industries such as financial services, insurance and health care to develop and deploy enterprise-grade artificial intelligence (AI) systems.
11/18/2020	Everyday Life Insurance	0.12	Everyday Life Insurance uses technology to make life insurance smarter and more inclusive.
11/18/2020	Stride Health	50.68	Stride Health is a health insurance recommendation engine. Stride Health quickly builds a health profile for each patient, then delivers a financial forecast for their “health year.” Stride’s algorithm then filters to find a recommendation with preferred doctors, prescription drugs, etc.
11/20/2020	PlumHQ	4.97	PlumHQ offers an online platform that provides employers and employees with customizable health insurance plans, pricing and health care experience.
11/23/2020	Waterdrop	630.25	Waterdrop, also known as Shuidi Huzhu, is an insurance platform that plans to solve the problem of high medical fees faced by most patients, especially those with a critical illness. When a user is diagnosed with a serious disease like cancer, the platform will crowdfund the medical fees from all of its users
11/30/2020	MyRealPlan	7.82	MyRealPlan is an online to offline platform that connects users to insurance plans and companies using databased algorithms, helping them to receive personalized insurance coverage.
12/7/2020	Centivo	68	Centivo is a new type of self-funded health plan built specifically for employers and their employees and families. Centivo targets zero health care trend and improved health care outcomes by rewarding members and providers for smart choices and actions while delivering an exceptional member experience.
12/7/2020	Laguna Health	6.6	Laguna Health is a digital health insurance company helping people realize their recovery potential.
12/10/2020	Hibob	115	Hibob, aka bob, is a cloud-based system that integrates human resources, benefits, pension, auto-enrollment and data in one secure online data storage platform. The company’s platform improves the workflow of managing and engaging employees, saving hours of administration.
12/16/2020	Bestow	138.1	Bestow is a full-stack insurance technology company that builds products and software that make life insurance accessible to millions of families. Bestow provides industry-first APIs enabling partners to offer customized life insurance coverage to their customers.
12/17/2020	Oscar Health	1632.5	Oscar is a technology-driven, consumer-focused, health insurance company using technology and personalized service to give members

Date	Company	Total Funding ($M)	Description
			transparency into the health care system and empower them to choose quality, affordable care.
12/20/2020	Curacel	0.04	Curacel works with African insurers to reduce fraudulent payouts and increase the efficiency of their claims processes. The company's solution has applicability per the company in health, auto and travel insurance
12/24/2020	Baoxian Chacha	2.94	Baoxian Chacha, developed by Fengping Technology, is a third-party online platform that provides insurance product comparison, planning, reviews, interpretation and customization.
12/31/2020	Betterfly	17.5	Betterfly, is a digital health and InsurTech company that uses data science and machine learning to automatically track and reward individual good habits with no-cost life insurance coverage and charitable donations.

About The Society of Actuaries

With roots dating back to 1889, the Society of Actuaries (SOA) is the world's largest actuarial professional organization with more than 31,000 members. Through research and education, the SOA's mission is to advance actuarial knowledge and to enhance the ability of actuaries to provide expert advice and relevant solutions for financial, business and societal challenges. The SOA's vision is for actuaries to be the leading professionals in the measurement and management of risk.

The SOA supports actuaries and advances knowledge through research and education. As part of its work, the SOA seeks to inform public policy development and public understanding through research. The SOA aspires to be a trusted source of objective, data-driven research and analysis with an actuarial perspective for its members, industry, policymakers and the public. This distinct perspective comes from the SOA as an association of actuaries, who have a rigorous formal education and direct experience as practitioners as they perform applied research. The SOA also welcomes the opportunity to partner with other organizations in our work where appropriate.

The SOA has a history of working with public policymakers and regulators in developing historical experience studies and projection techniques as well as individual reports on health care, retirement and other topics. The SOA's research is intended to aid the work of policymakers and regulators and follow certain core principles:

Objectivity: The SOA's research informs and provides analysis that can be relied upon by other individuals or organizations involved in public policy discussions. The SOA does not take advocacy positions or lobby specific policy proposals.

Quality: The SOA aspires to the highest ethical and quality standards in all of its research and analysis. Our research process is overseen by experienced actuaries and nonactuaries from a range of industry sectors and organizations. A rigorous peer-review process ensures the quality and integrity of our work.

Relevance: The SOA provides timely research on public policy issues. Our research advances actuarial knowledge while providing critical insights on key policy issues, and thereby provides value to stakeholders and decision makers.

Quantification: The SOA leverages the diverse skill sets of actuaries to provide research and findings that are driven by the best available data and methods. Actuaries use detailed modeling to analyze financial risk and provide distinct insight and quantification. Further, actuarial standards require transparency and the disclosure of the assumptions and analytic approach underlying the work.

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Endnotes

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