Life Insurance & AI/Data Science

Yosuke Fujisawa

Introduction

Yosuke Fujisawa

FIAJ, CERA, Certified Pension Actuary

2000 **Sumitomo Trust & Banking**
- Fellow of Institute of Actuaries of Japan
- Certified Pension Actuary

2008 **Master of ActSc, University of Waterloo**

2011 **Lifenet Insurance, GM of risk management**
- CERA
- Part-time lecturer at Osaka University

2014 **RGA Reinsurance Company, Director**

2017 **Swiss Reinsurance Company, Vice President**
- Part-time lecturer at Waseda University

2020 **Sumitomo Life, Data Science Officer**
- Chair of EFR forum, IAA
- Member of AI taskforce, IAA
- Visiting professor at Waseda University

ICA2026 Tokyo

The Institute of Actuaries of Japan
Think the Future, Manage the Risk

About ICA2026 Tokyo

Dates	**November 8th – 13th, 2026**
Venue	Tokyo International Forum
Style	Hybrid
Theme	*Tradition, Diversity, Innovation*

Venue (Tokyo International Forum)

- Tokyo International Forum is located in the heart of Tokyo.
- It offers excellent access to hotels, restaurants, train stations, and airports.

The official website and SNS accounts can be accessed through the QR code or URL provided below.

ICA2026 Official Website

- **https://ica2026.org/**

ICA2026 Official SNS Accounts Information

X: ICA2026 Tokyo (@ICA2026)
https://twitter.com/ICA2026

Facebook: ICA2026 Tokyo (ica2026.tokyo)
https://www.facebook.com/ica2026.tokyo

LinkedIn: ICA2026 Tokyo
https://www.linkedin.com/company/ICA2026/

Agenda

1. Sumitomo Life: Vitality & PayPay insurance
2. Opportunities: AI and Data Science Applications
3. Risks: AI Risk Management

Company Overview

- Established: May 1907

Key Figures[1] – 1H FY2025 (as of Sep 2025)

- Premium income: JPY 1.76tn (USD 11.8bn) (JPY 3.37tn in FY2024)
- Core business profit[2]: JPY 196.5bn (USD 1.3bn) (JPY 379.8bn in FY2024)
- Total assets: JPY 49.25tn (USD 330.8bn)
- Annualized premiums from policies in force[3]: JPY 3.65tn (USD 24.5bn)
- Solvency margin ratio: 668.6%
- Economic value-based solvency ratio : 184%
- Embedded value[4] (EEV) : JPY 6.41tn (USD 43.0bn)
- Number of sales representatives(tied agents): 31,825
- Insurer financial strength rating[5]: A+ [S&P], A1 [Moody's], A+ [Fitch], AA [R&I], AA [JCR]

Source: Company disclosure.

1. Consolidated figures. USD amounts in parentheses in this presentation (except as otherwise stated) are translated from JPY using USD1 = JPY148.88, as of September 30, 2025.
2. Core business profit of the group (see page 6 for details).
3. Figures for individual life and individual annuity for domestic business (see page 5 for details).
4. Combined figures of Sumitomo Life's EEV, Medicare Life's EEV, Symetra's EEV and Singlife's EEV (see page 8 for details).
5. As of October 31, 2025.
6. As of September 30, 2025 on ownership

Group Overview[6]

Empowering your future
SUMITOMO LIFE

Domestic

Life Insurance

メディケア生命 住友生命グループ

Medicare Life Insurance

- Sells simple and affordable products through banks and outlets
- 100% subsidiary

Small-amount and Short-term Insurance

アイアル 住友生命グループ

AIARU Small Amount & Short Term Insurance

- 100% subsidiary

Insurance Outlets

ほけん百花

保険デザイン Agent IG Holdings 保険ほっとライン hoken line.com

Izumi Life Designers / INSURANCE DESIGN / Agent IG Holdings / Mycommunication

- Also sell other insurers' products
- Ownership: 100% / 95% / 30.45% / 43%

Overseas

U.S.

SYMETRA

Symetra Financial Corp

- Life insurance group operating businesses across the U.S.
- 100% subsidiary since February 2016

Singapore

Singlife

Singlife Holdings

- An insurance group formed by the merger of Aviva Singapore, a major insurance company, and Singlife, an insurtech company
- 100% subsidiary since March 2024

China

PICC

PICC Life

- Life insurance JV with PICC group
- Owns 10% of the shares

Vietnam

BAOVIET

Baoviet Holdings

- The largest financial / insurance group in Vietnam
- Owns 22.08% of the shares

Indonesia

BNI Life

PT BNI Life

- JV with BNI, a national bank
- Owns 39.99% of the shares

Overview of Japanese life insurance market

1. Long-Established Domestic Insurers
Japan's life insurance market is largely composed of a few major domestic insurers (e.g., **Nippon Life, Dai-ichi Life, Meiji Yasuda Life, Sumitomo Life**) that have been in operation for decades. These insurer benefit from strong brand recognition and extensive distribution networks, giving them a substantial home-market advantage.

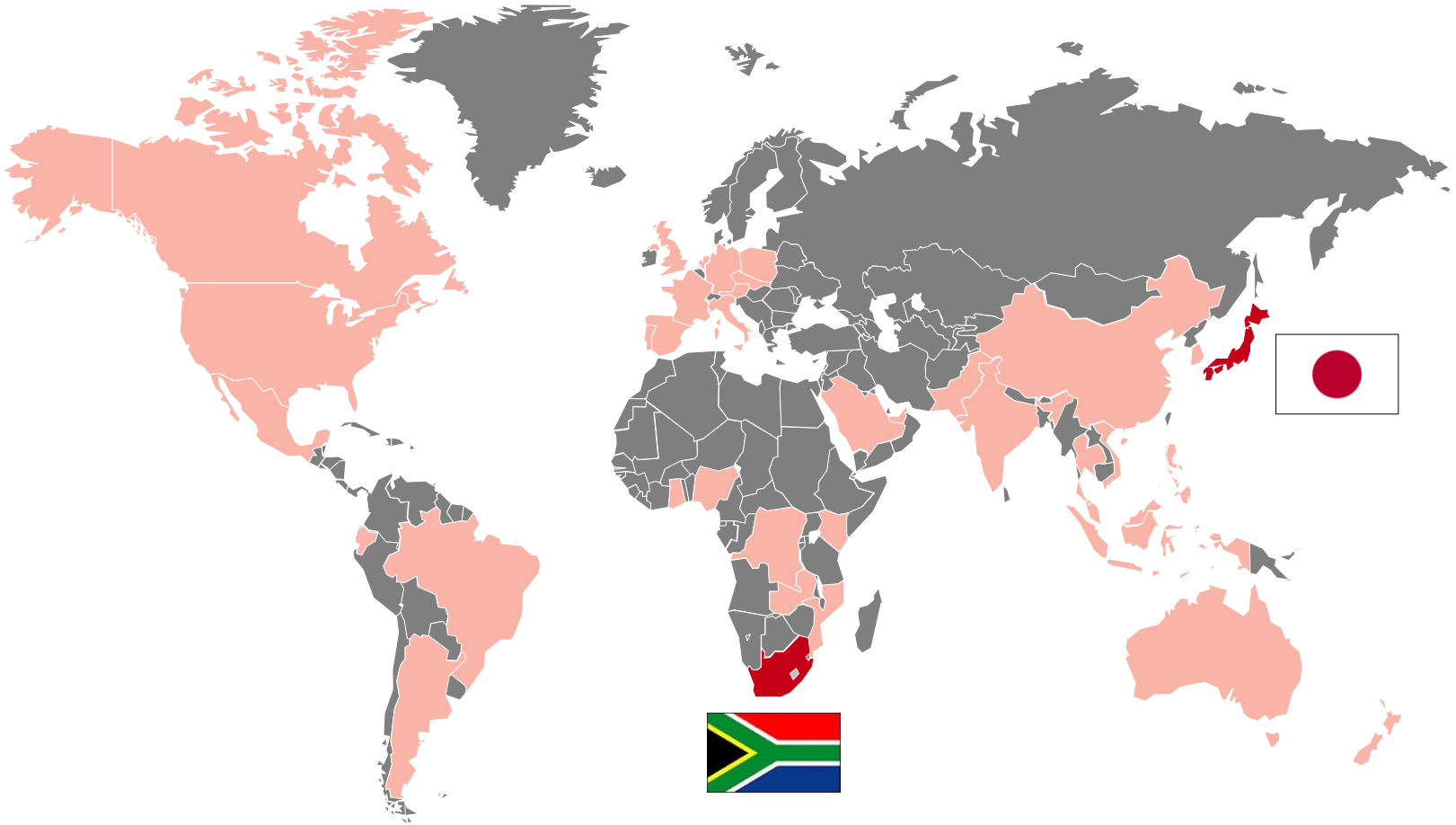
2. Aging Population
With one of the world's fastest-aging populations, Japanese consumers tend to prioritize insurance products that go beyond simple death coverage, especially **hospital cash, critical illness, and LTC**. As a result, insurers frequently innovate and bundle policies with **health & wellness incentive**s to improve healthy life expectancy.

3. Bancassurance and Agency Channels
While traditional door-to-door sales remain a key part of the distribution model, bancassurance and large agency networks have become increasingly important. Many insurers collaborate with **banks, post offices, and insurance shops** to extend their reach to a broad customer base.

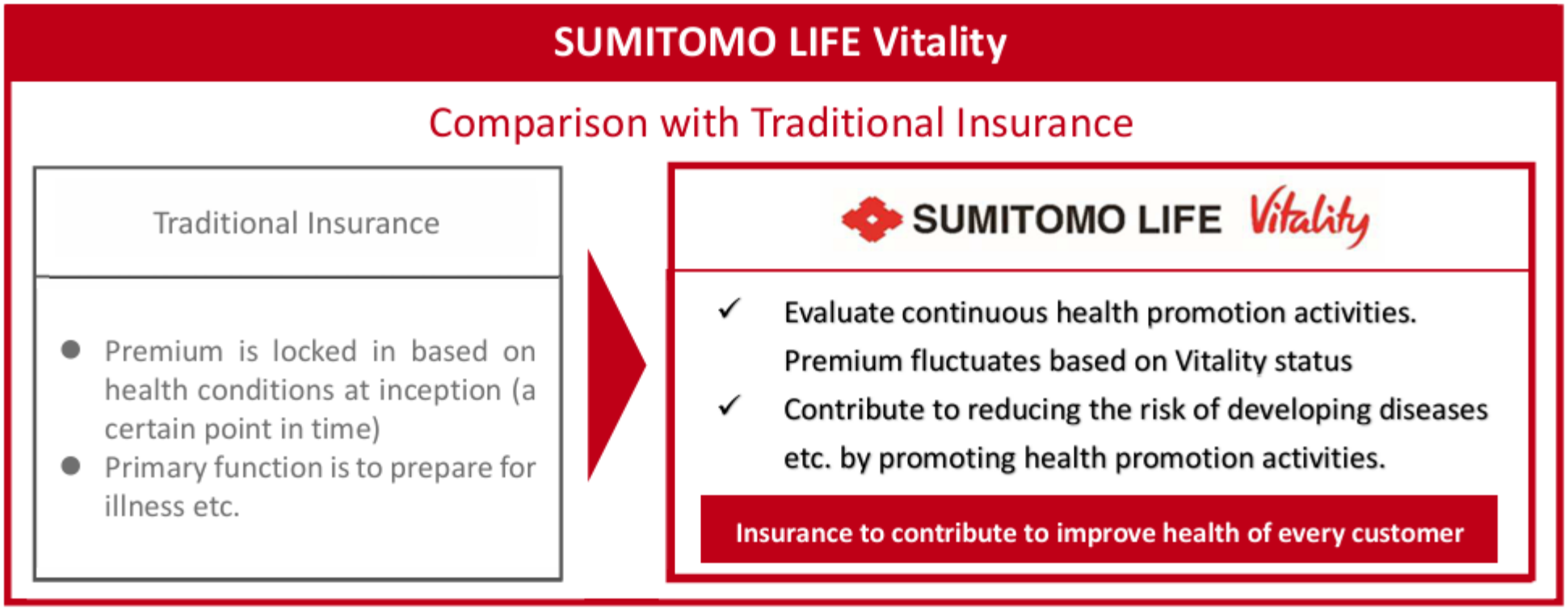
4. High Level of Household Penetration
Life insurance penetration is **very high** in Japan. Culturally, there is a long history of relying on life insurance to provide financial security for dependents. In many cases, multiple smaller policies (e.g., cancer insurance, hospital cash insurance, term life) are held by a single individual or household.

Vitality Program

Approximately 42 million members in 41 countries and territories worldwide.



Vitality insurance



Health Promotion Activities

See P8~ for details

Know Your Health

- Online Assessment ➡ Up to 3,000pt
- Vitality Health Check ➡ Up to 10,000pt
- Screening ➡ Up to 2,000pt

Improve Your Health

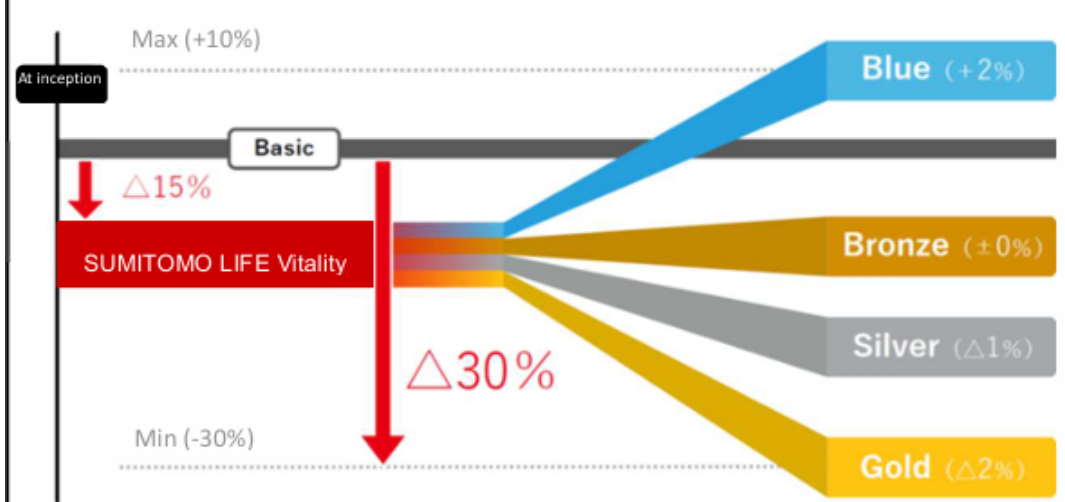
- Physical Activities & Fitness ➡ Up to 14,000pt

Status Determined by Points

- Blue 0pt～
- Bronze 12,000pt～
- Silver 20,000pt～
- Gold 24,000pt～

Premium Flex (image)

See P13 for details



Enjoy the Rewards

See P10 for details

- Members get discounts on hotels etc. depending on their Vitality status.
- Members receive a free coffee, etc. based on the points earned in a week.

Vitality insurance

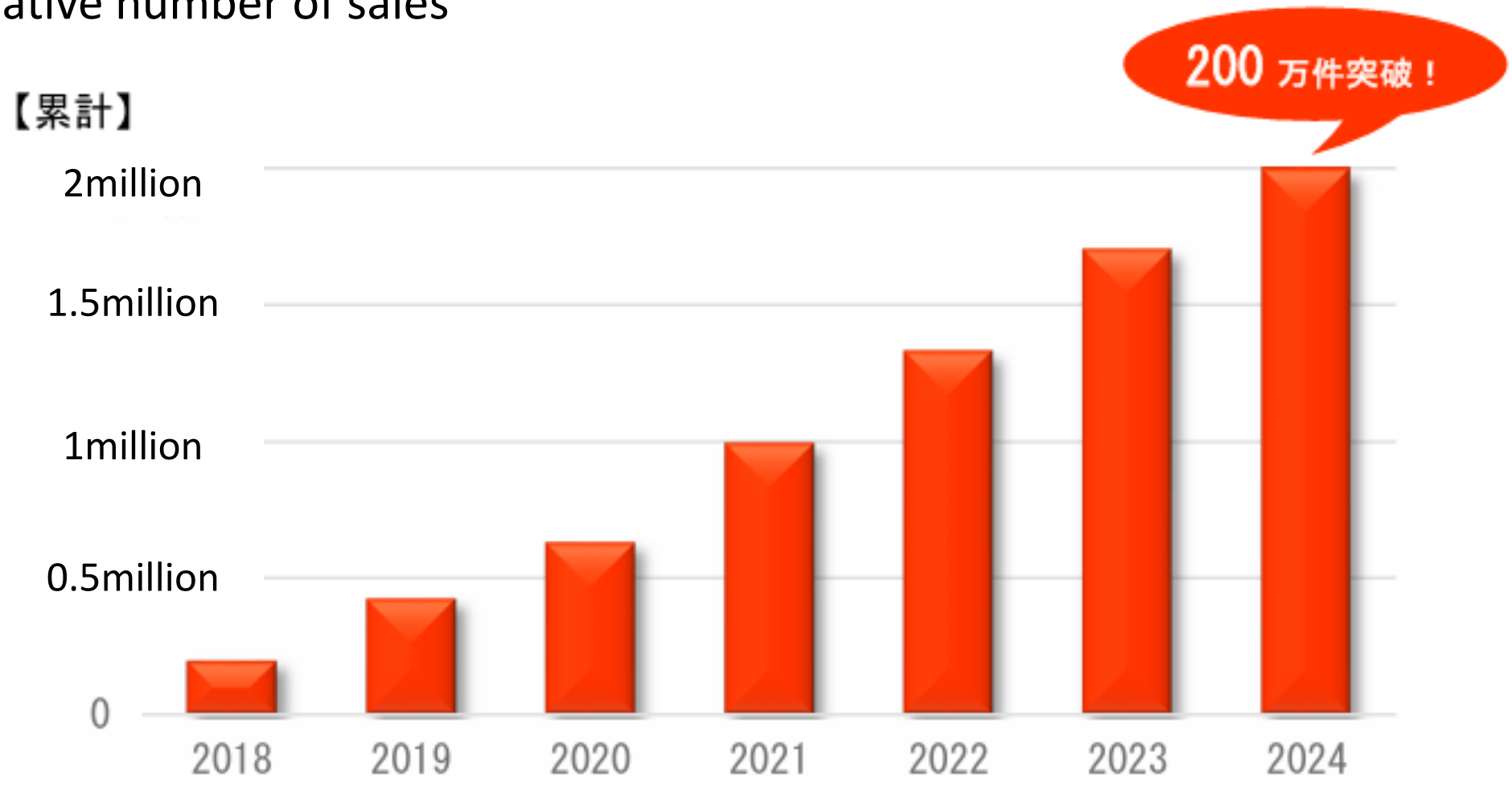
1. Automatic Setting of Exercise Point Goals
By launching the "Active Challenge" feature in the Vitality app, weekly point goals are automatically set.

2. Work Toward Achieving Goals
Engage in physical activities to aim for achieving the set goals.

3. Earn Rewards by Reaching Exercise Point Goals
Enjoy various rewards such as drinks. You can also choose to make a donation instead of receiving drinks or other rewards.

Vitality insurance

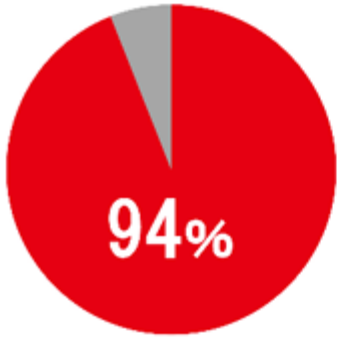
Cumulative number of sales



Vitality insurance

1. change one's mindset

I'm more health conscious than before I joined.

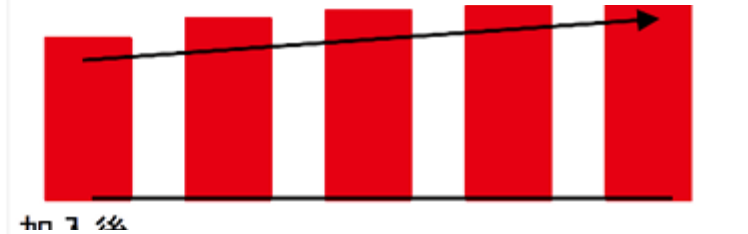


2. change one's behaviour

% increase in steps per day

+22% ※4

Continue moderate exercise



Join	1yr	2yrs	3yrs	4yrs
7,447歩	8,332歩	8,687歩	8,916歩	9,113歩

3. outcome

Blood pressure dropped

50%

※10mmHg以上

Blood glucose dropped

42%

※10mg/dl以上

LDL cholesterol dropped

49%

※10mg/dl以上

Vitality insurance

- Examining previous studies conducted in Japan, we could not find any health promotion programmes that successfully increased step counts for as long as three years. The paper, "Ongoing Incentives' 36-Month Effect on Physical Activity in a Japanese Insurance-Based Health-Promotion Program", quantified the effects of step count increase.

Table 2. Model-adjusted average daily step counts over 36 months

Month	Adjusted Average Step Count (steps/day)	95% Confidence Interval	P-value [a]
1	7,239.7	(7,213.4, 7,266.0)	Reference
12	9,054.9	(9,023.7, 9,086.2)	< .001
24	9,350.1	(9,318.4, 9,381.8)	< .001
36	9,392.7	(9,361.1, 9,424.3)	< .001

Estimates were adjusted for elapsed months (fixed effect), age (continuous), gender (categorical; men as the reference), residential area (categorical; Kanto as the reference), and season (categorical; winter as the reference). Random effects of slope and intercept were included for individual participants, and a first-order autoregressive correlation structure was applied to account for temporal dependency.

[a] P-values indicate comparisons to Month 1 as the reference category.

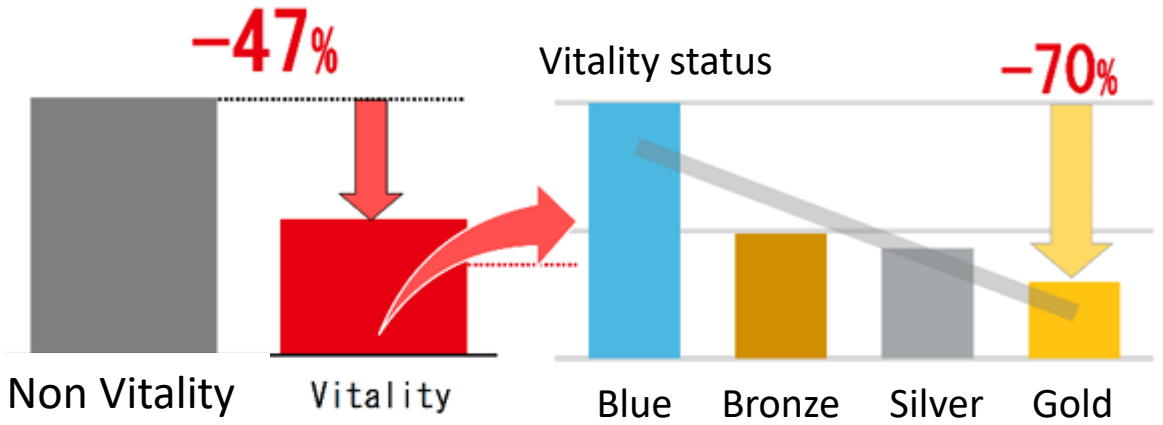
30% increase

Differences in gender, age, residential area, and season were adjusted using the GLMM statistical model.

Vitality insurance

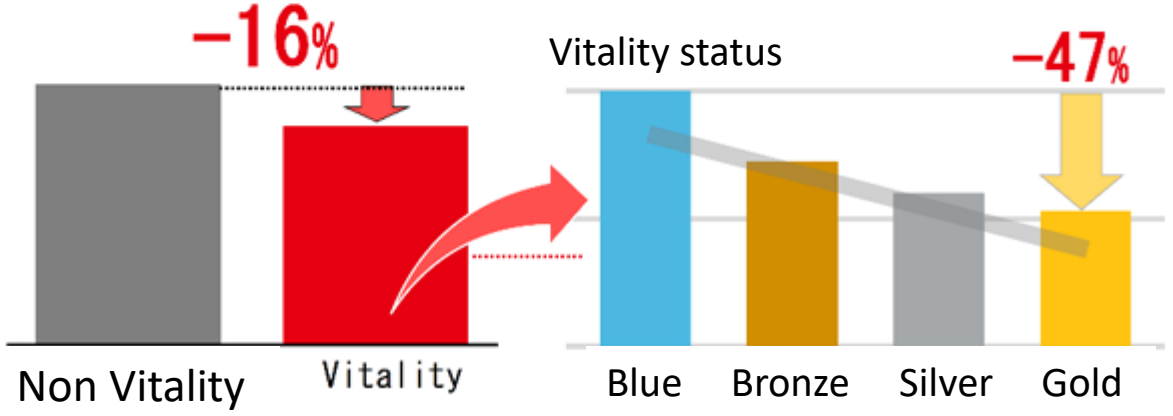
[redacted] Mortality [redacted]

Vitality has 47% lower mortality rate than Non Vitality



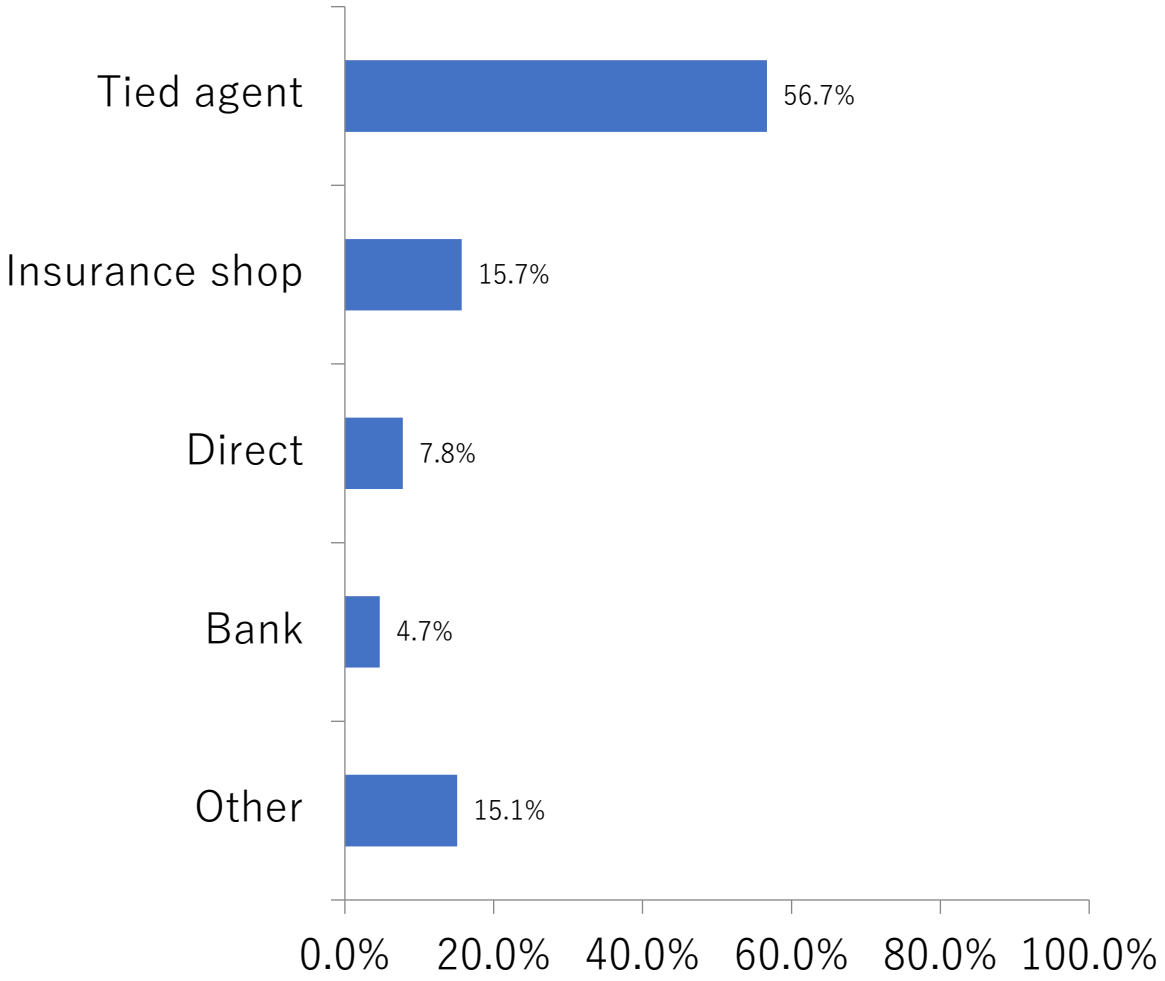
[redacted] Hospitalization rate [redacted]

Vitality has 16% lower hospitalization rate than Non Vitality

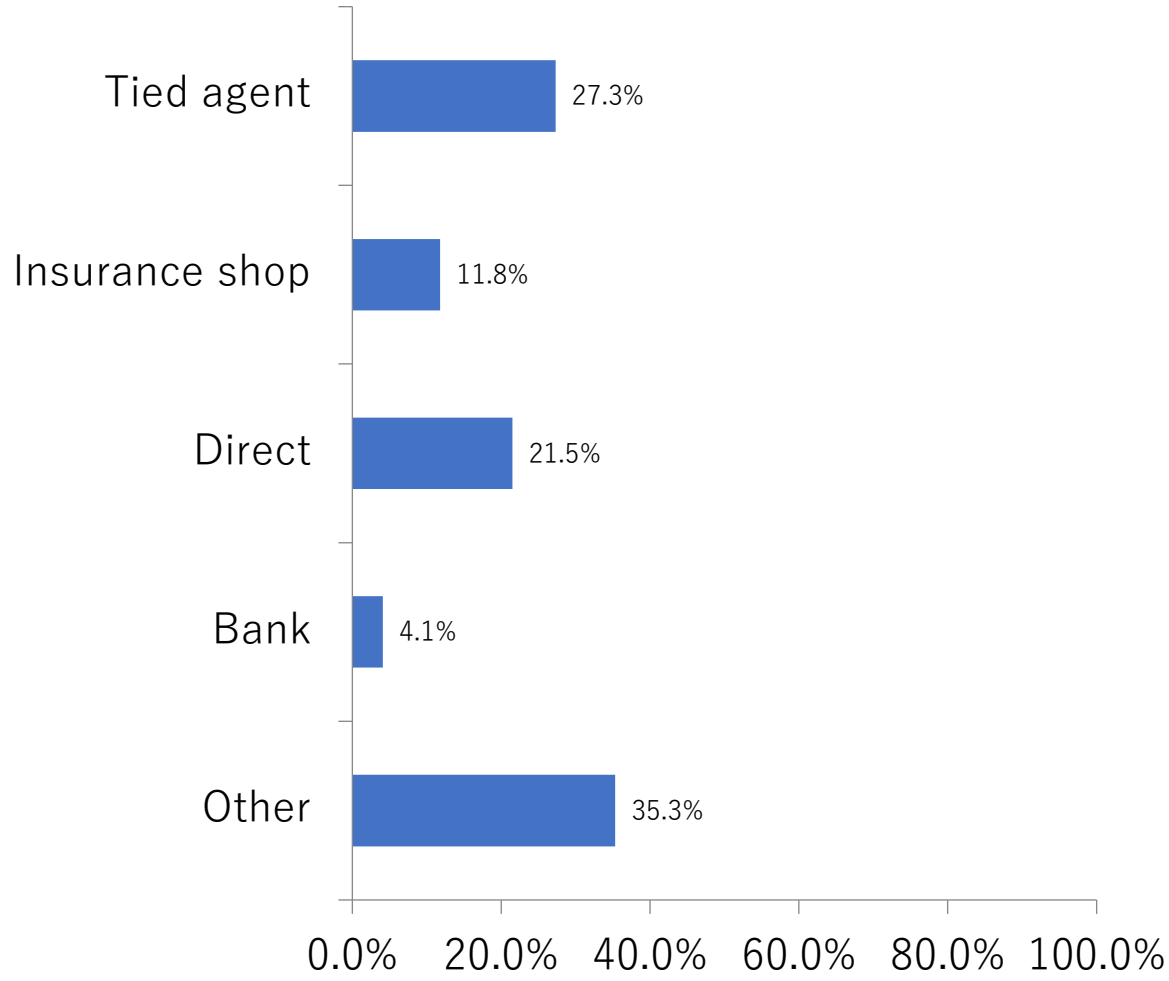


Insurance distribution channel

Channel purchased

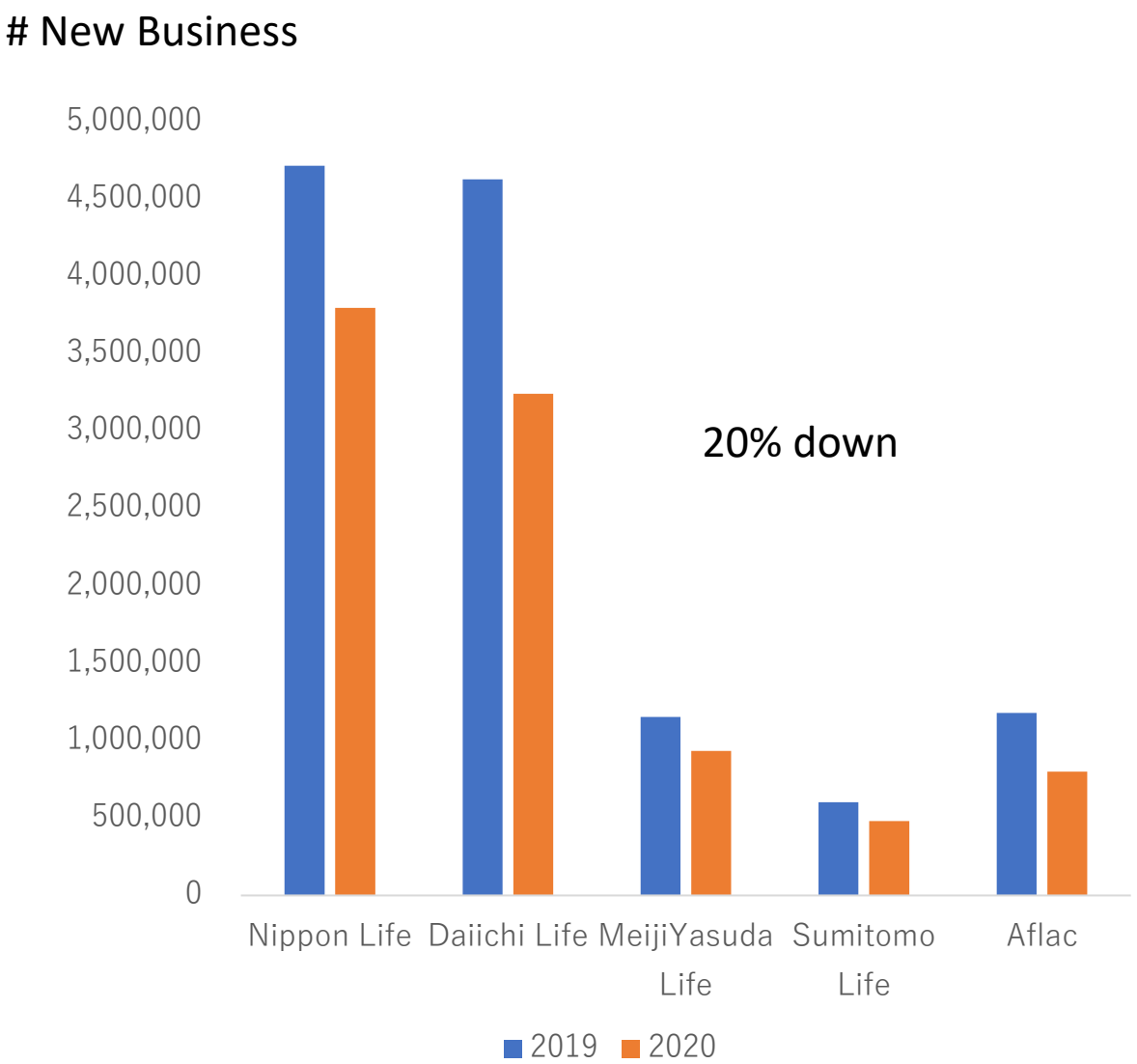


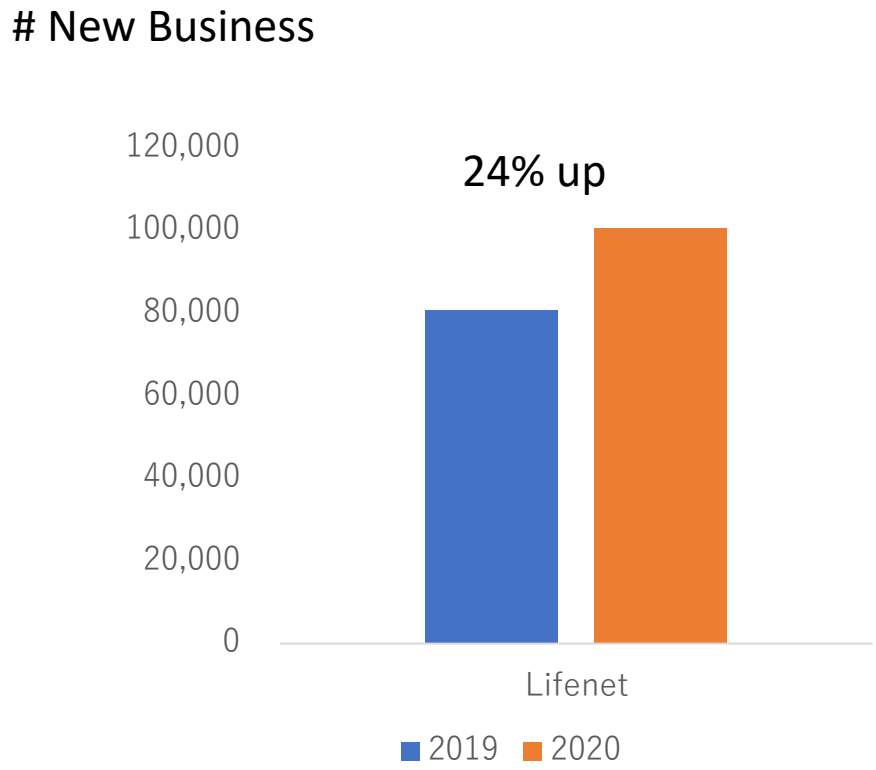
Channel of intention to purchase



Source: Japan Institute of Life insurance

New business of individual life insurance during the Covid-19





Our digital and data strategy

1. Expansion of Products and Services
By harnessing the power of digital technology and data, we aim to further evolve our Vitality services and create new **well-being services in non-insurance areas**, in addition to our traditional insurance products. This will enable us to offer products and services tailored to the diversifying needs and lifestyles of our customers.

2. Expansion of Customer Touchpoints
To create well-being services, collaboration and co-creation with new business partners such as **local governments, corporations, and platform providers** are essential. By leveraging the customer base of these business partners, we aim to expand our touchpoints with customers and deliver the value of "well-being" to a broader audience.

3. Providing Personalized Value
By accumulating and utilizing customer touchpoint data, as well as unique health data specific to Sumitomo Life, we aim to create **optimized customer experiences for each individual**. This will be achieved by combining multiple products and services to deliver tailored value to every customer.

4. Stabilizing Business Foundations
By leveraging the latest digital technologies, including **generative AI**, we aim to enhance efficiency and automate operations. This not only improves customer experience value but also ensures business continuity in an environment where the working population continues to decline, thereby stabilizing our business foundations.

PayPay insurance: Heatstroke

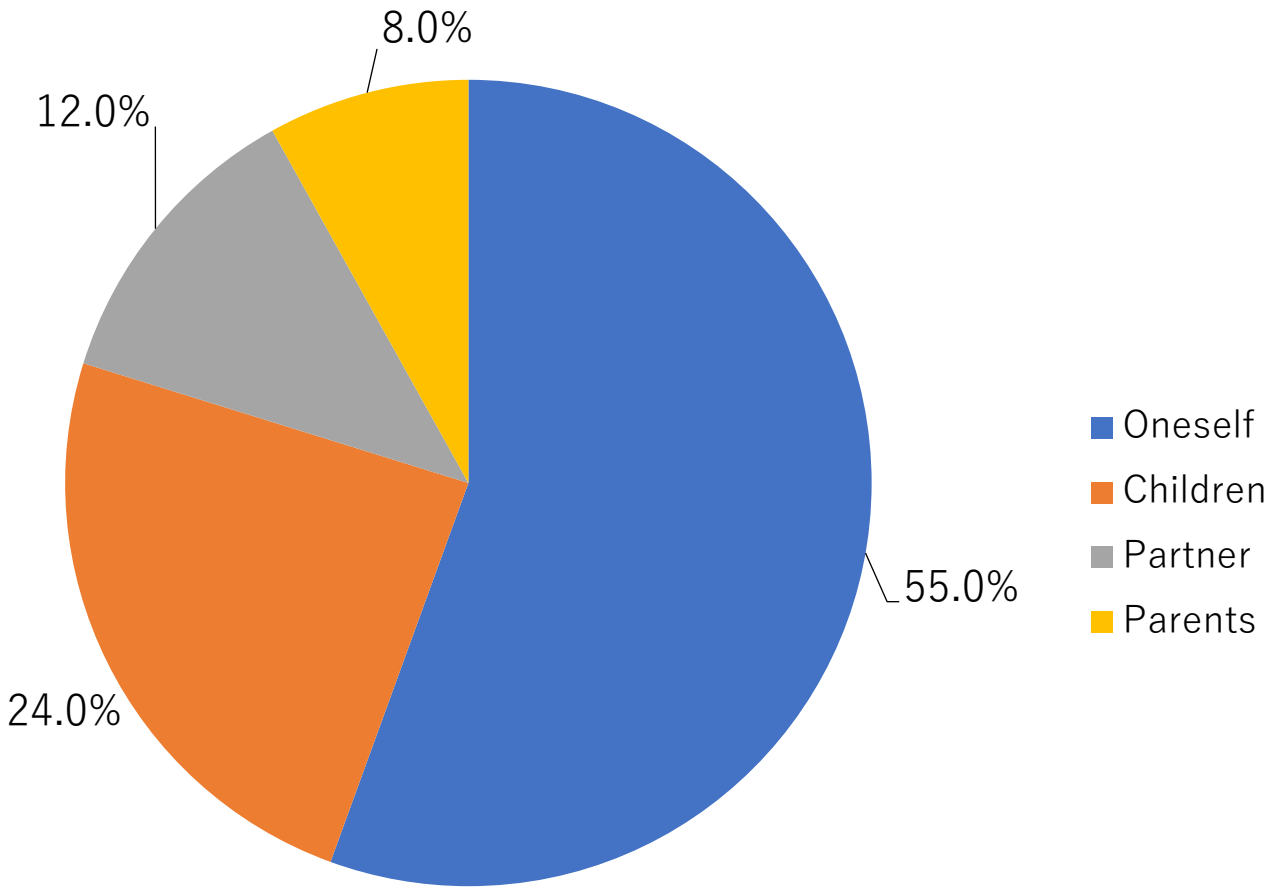
PayPay: 67 million registered users

PayPay insurance: Heatstroke

2 types of benefits:

1. **Medical Treatment Insurance Coverage**: When an insured person suffers from heatstroke during the insurance period* and undergoes intravenous treatment at a hospital.
2. **Hospitalization insurance benefit**: When the insured person suffers from heatstroke during the insurance period * and is hospitalized for more than 2 days (1 night and 2 days) continuously for the purpose of treatment.

* Insurance period is monthly type (1-7 months) or daily type (1-7days).



Source: PayPay insurance HP

PayPay insurance: Heatstroke

- It is said that heat stroke affects approximately **300,000 people** annually and **90,000 people** are transported to hospital in an emergency.
- If your identity has been verified on the PayPay app, you can skip entering your name and other information, making the application process smooth. In addition, family members can also apply at the same time.
- You can apply for coverage for as little as **JPY100 per day**, providing coverage when you need it.
- If you apply by 9:00am, coverage is available from 10:00am on the same day. If you plan to participate in outdoor sports activities, events, or outdoor work, you can apply for coverage at a reasonable premium.
- Claims can be completed by uploading receipts and medical statements issued by medical institutions from the PayPay app. The claim will be paid to the designated account on the same day as the earliest claim date.

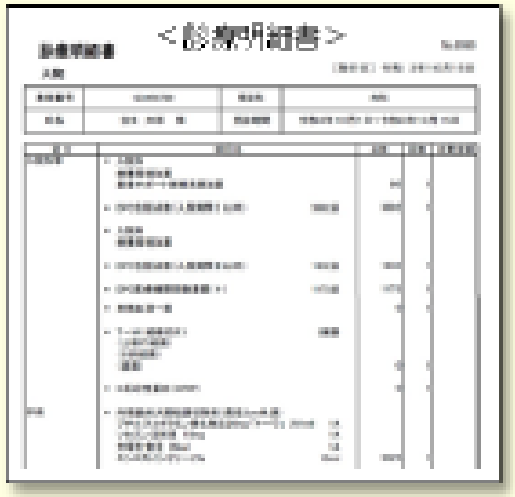
AI & Machine learning

PayPay insurance: Heatstroke

Digitalization with AI-OCR

Image to text with AI-OCR

アップロードされた診療明細書の画像データをテキスト化



読取り (AI-OCR)

Digitalize medical treatments and remedies

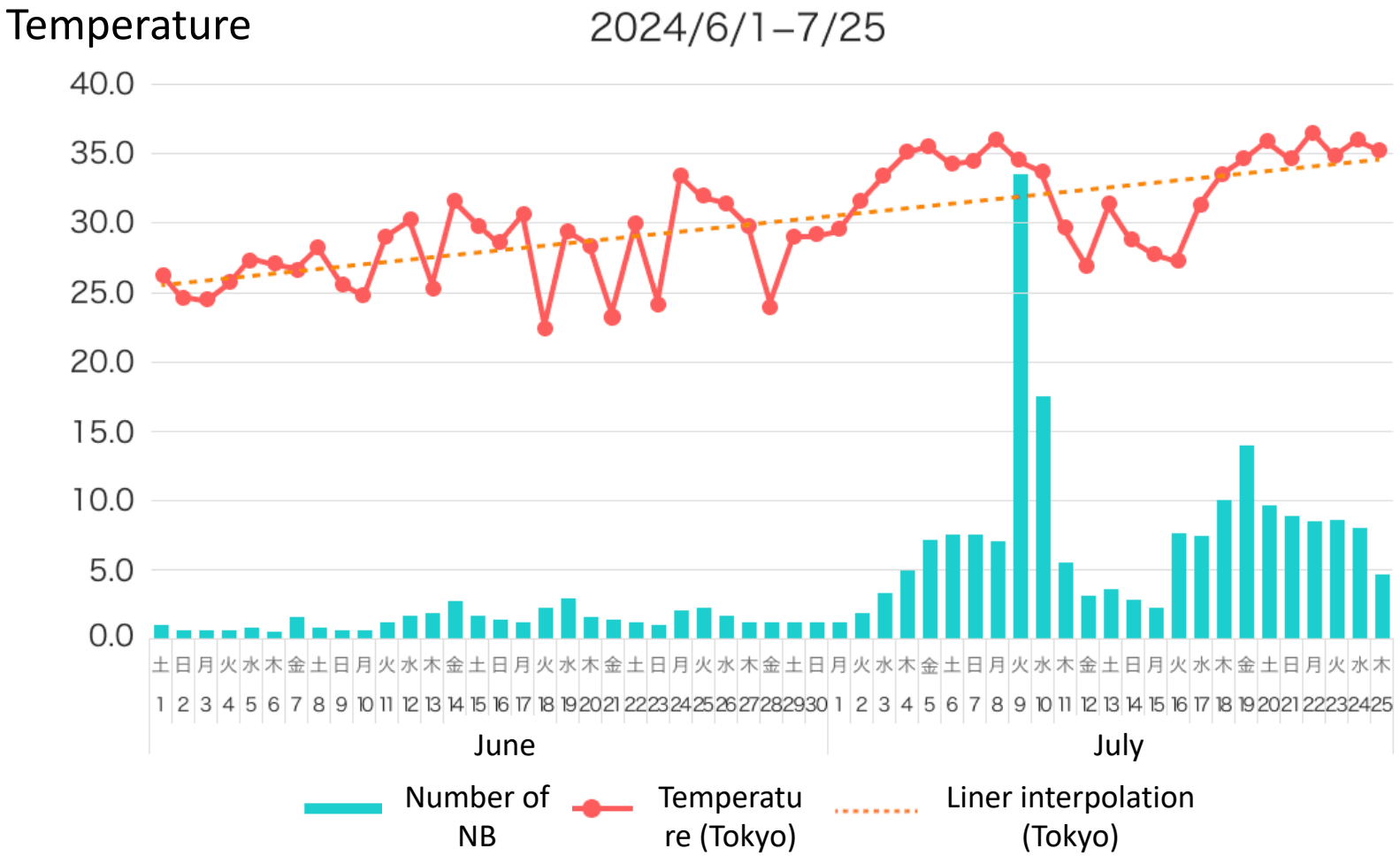
Example:

Length of stay in hospital: 1 October 2021 to 5 October 2021.

Medical treatment: intravenous drip

PayPay insurance: Heatstroke

Heatstroke Compensation Insurance
Number of new business vs. temperature



Source: PayPay insurance HP

PayPay insurance: Heatstroke

White Paper

Relationship between Health/Lifestyle Habits and Heatstroke
through real world data

【Overall trend】
- Lifestyle-related diseases including hypertension greatly increase heatstroke risks
- Important to adopt a healthy lifestyle habit to contain heatstroke risks
- Daily walking habits may help prevent heatstroke from becoming severe

April
2025

PayPay insurance: Heatstroke

01 Point

Sharing information on a timely basis

Multiple media resulted in covering the topic because we published our news release a day before the Special Heatstroke Alert started operating (23 April).

02 Point

Contributing to social issues

Due to the impact from climate change, there are over tens of thousands of people nationwide urgently transported to the hospital every year due to heatstroke, and this has become a social issue.

03 Point

Conciseness of the key message

We selected key messages including “Lifestyle-related diseases largely increase heatstroke risks”, “Adopt healthy lifestyle habits to prevent heatstroke”, “Walking habits prevent heatstroke from becoming severe” intended to relate Vitality to heatstroke.

PayPay insurance: Covid-19

December 2021

- Sompo Japan began selling COVID-19 insurance within the PayPay app.
- The insurance premium starts at an affordable rate of 500 yen for three months, and policyholders can receive a payout of 50,000 yen if diagnosed positive by a doctor.

Feb 9th, 2022

- Since mid-January, the number of policy enrollments grew rapidly, surpassing 350,000.

Feb 10th, 2022

- Sompo Japan raised the premium for COVID-19 insurance to 1,500 yen for three months starting February 10, tripling the original rate. This adjustment was made due to the spread of the sixth wave of COVID-19, driven by the Omicron variant, which exceeded initial projections.

June 14th, 2022

- Sompo Japan announced that it would reduce the insurance payout for its COVID-19 insurance by 60% from the original amount, lowering it to 20,000 yen.

August 4th, 2022

- Sompo Japan ceased the sale of its COVID-19 insurance. This decision was due to the rapid surge in infections, which made it difficult to maintain the product.

PayPay insurance: Covid-19

January 2025

- Sumitomo Life Group announced on January 28 that it will start selling insurance that covers the costs associated with the COVID-19.

	Product spec
Launch date	January 28th, 2025
Insurance period	6 months. The coverage start date can be specified from 14 to 30 days after the application date.
Age	Policyholder: Aged 18 to 99 Insured: Aged 12 to 69
Coverage	If, during the policy period, the insured is prescribed any of the 4 types of medications at a hospital.
Premium	Simple plan: JPY 100 (+ 340 funded by Shionogi & Co., Ltd.) for SA JPY 15k Basic plan: JPY 190 (+ 340 funded by Shionogi & Co., Ltd.) for SA JPY 20k Safety plan: JPY 370 (+ 340 funded by Shionogi & Co., Ltd.) for SA JPY 30k

*Shionogi & Co., Ltd. is a leading Japanese pharmaceutical company that specializes in the research, development, manufacturing, and marketing of prescription drugs and over-the-counter medications.

PayPay insurance: Influenza

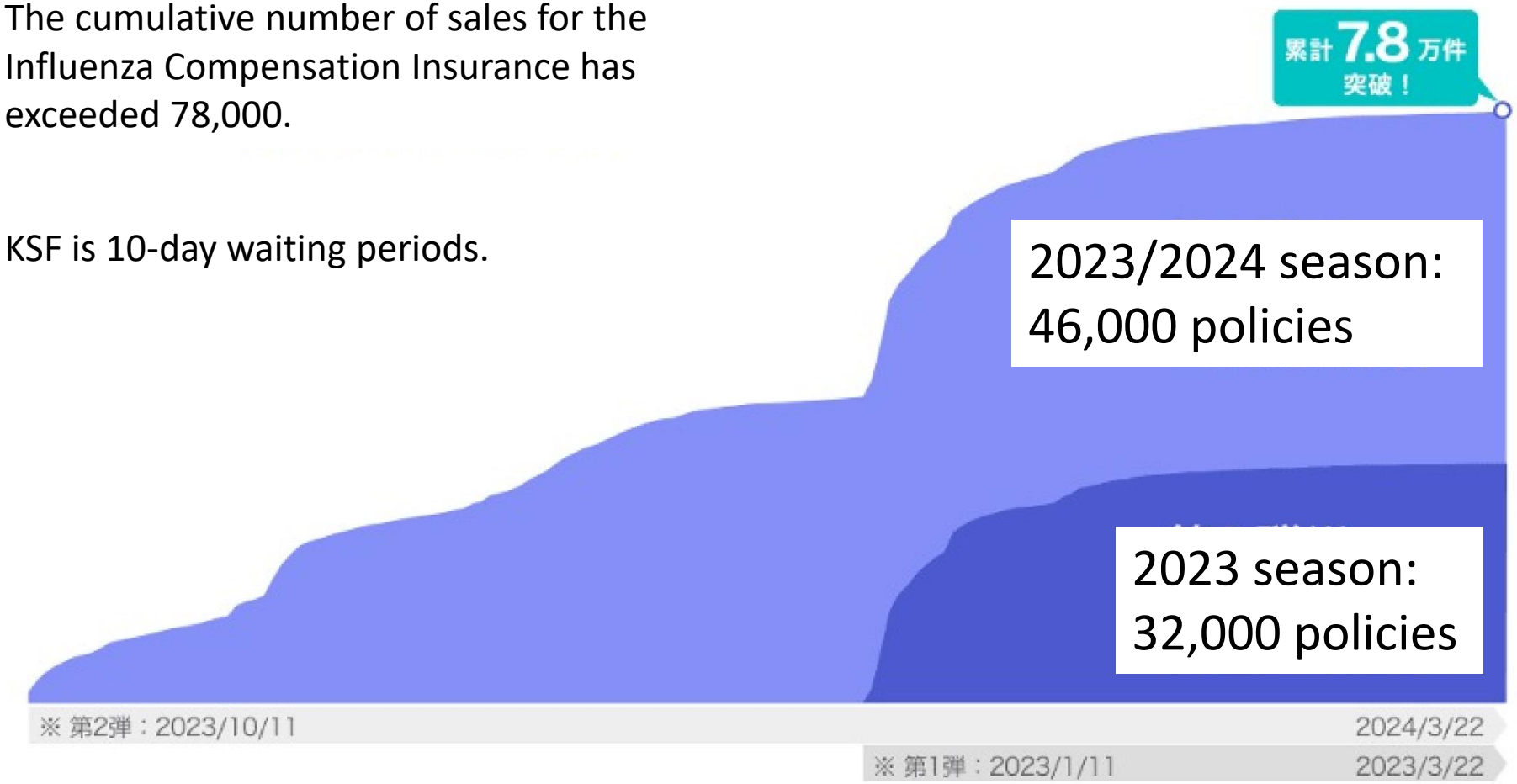
Sumitomo Life Group

インフルエンザお見舞い金

PayPay ほけん

The cumulative number of sales for the Influenza Compensation Insurance has exceeded 78,000.

KSF is 10-day waiting periods.



Source: PayPay insurance HP

PayPay insurance: Influenza

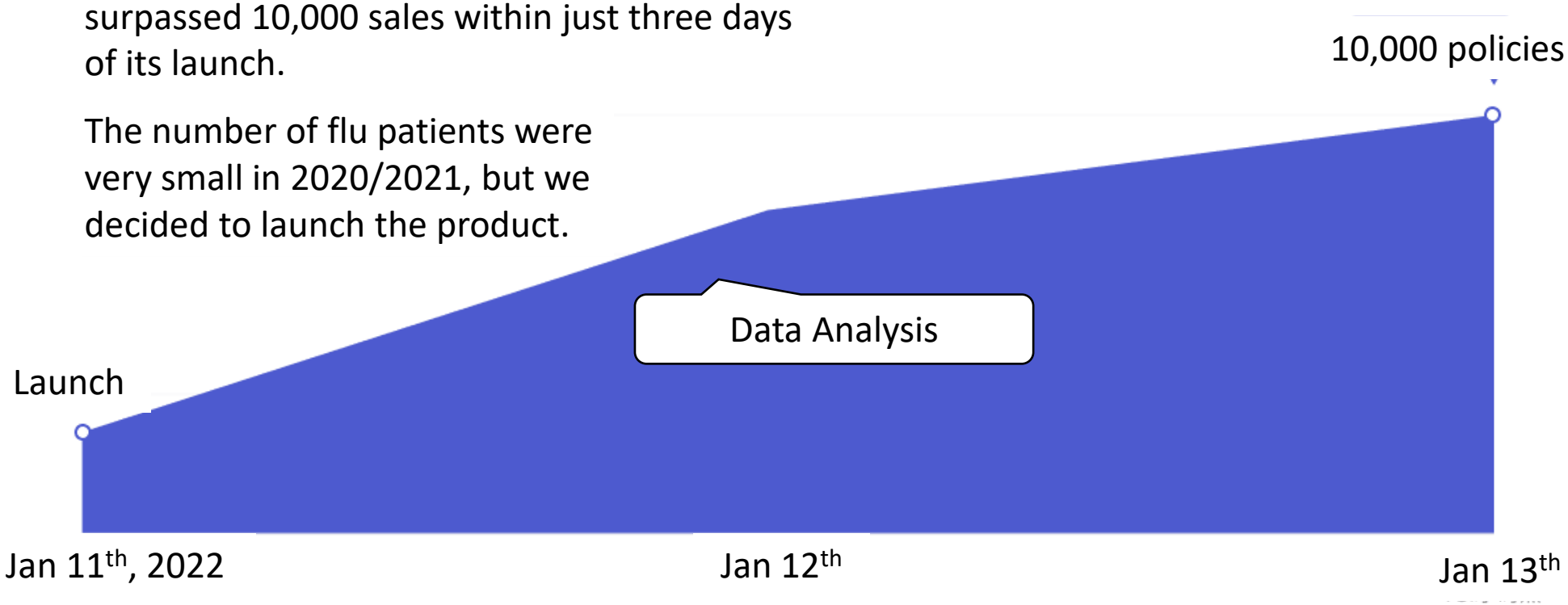
Sumitomo Life Group

インフルエンザお見舞い金

PayPay ほけん

The Influenza Compensation Insurance surpassed 10,000 sales within just three days of its launch.

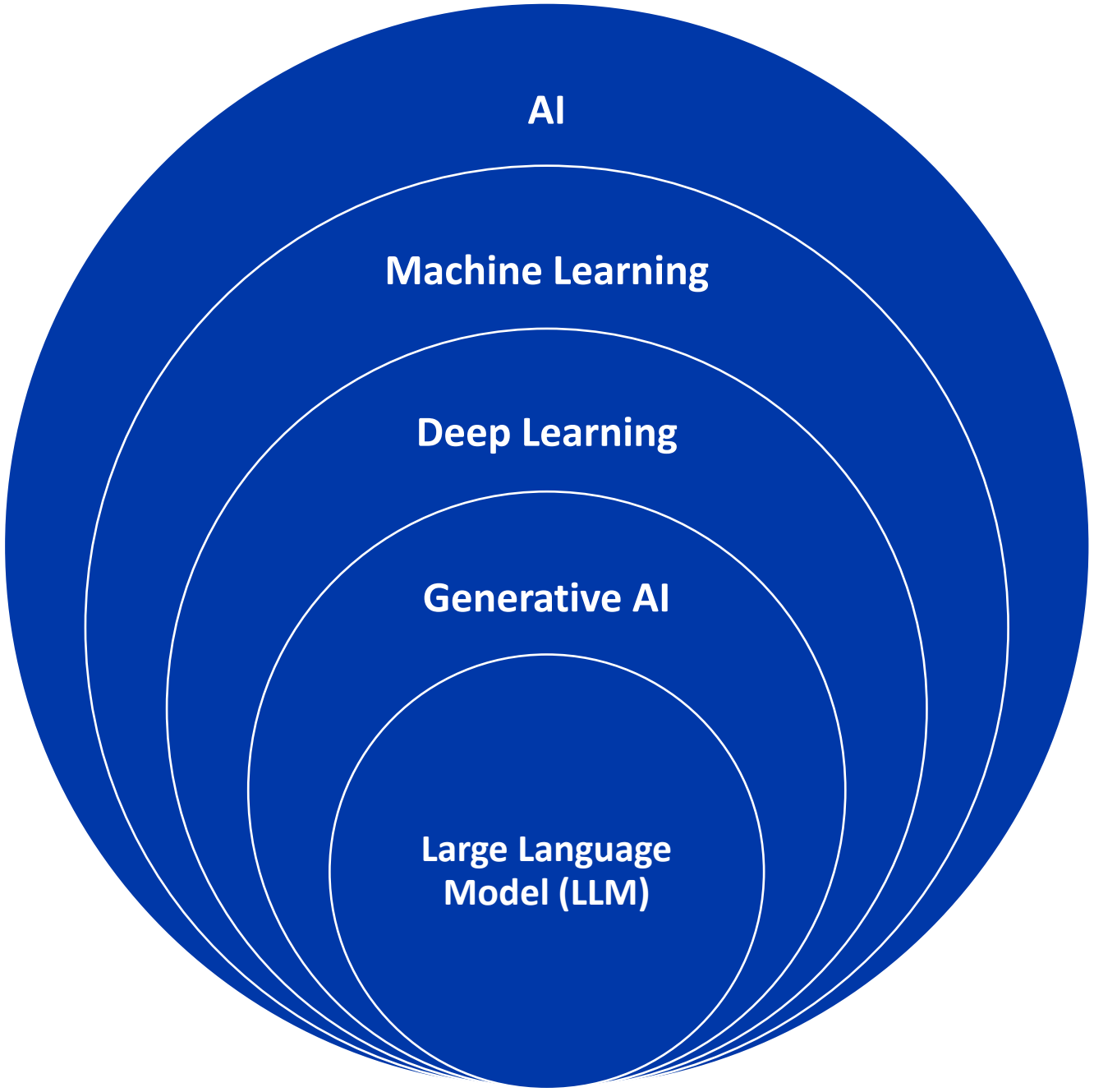
The number of flu patients were very small in 2020/2021, but we decided to launch the product.



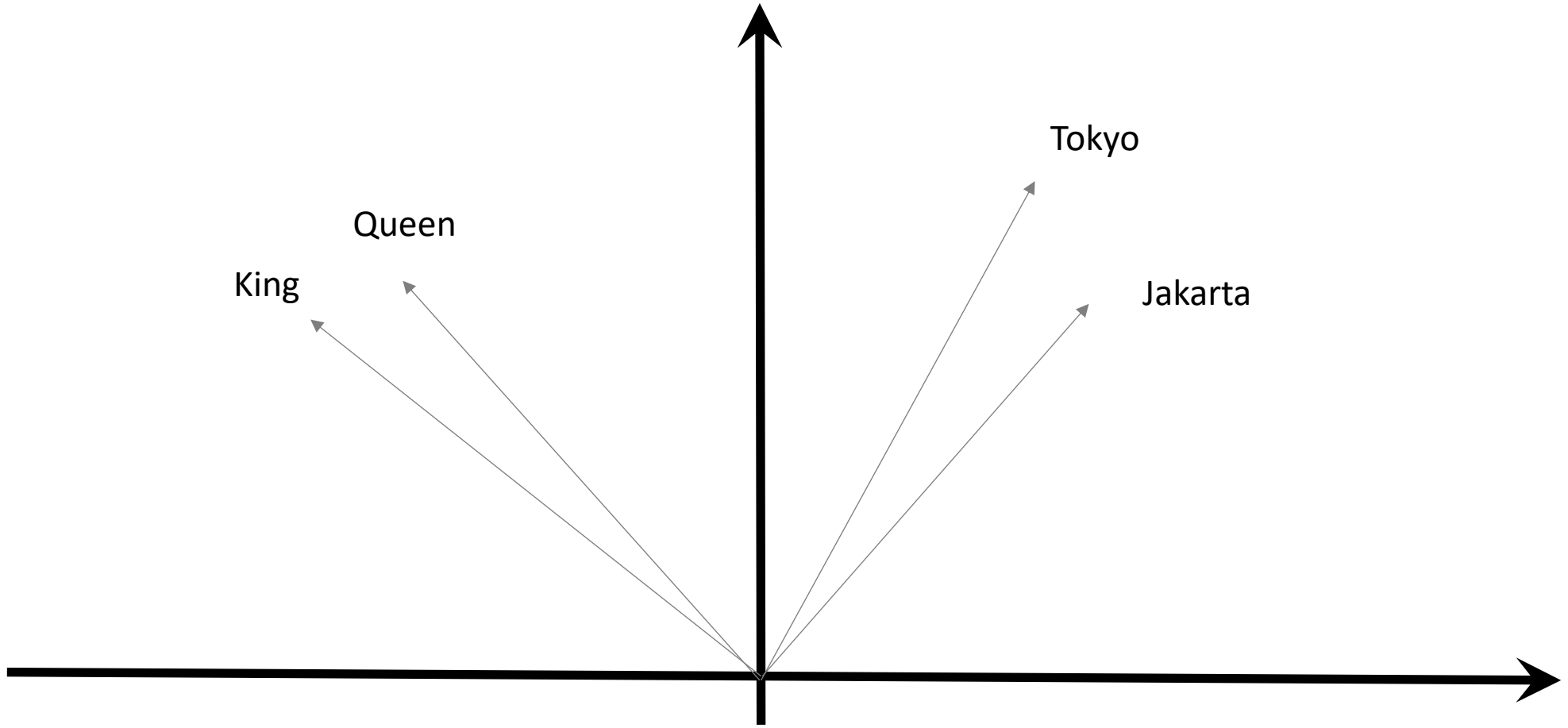
Source: PayPay insurance HP

Agenda

1. Sumitomo Life: Vitality & PayPay insurance
2. Opportunities: AI and Data Science Applications
3. Risks: AI Risk Management


AI
Machine Learning
Deep Learning
Generative AI
Large Language Model (LLM)

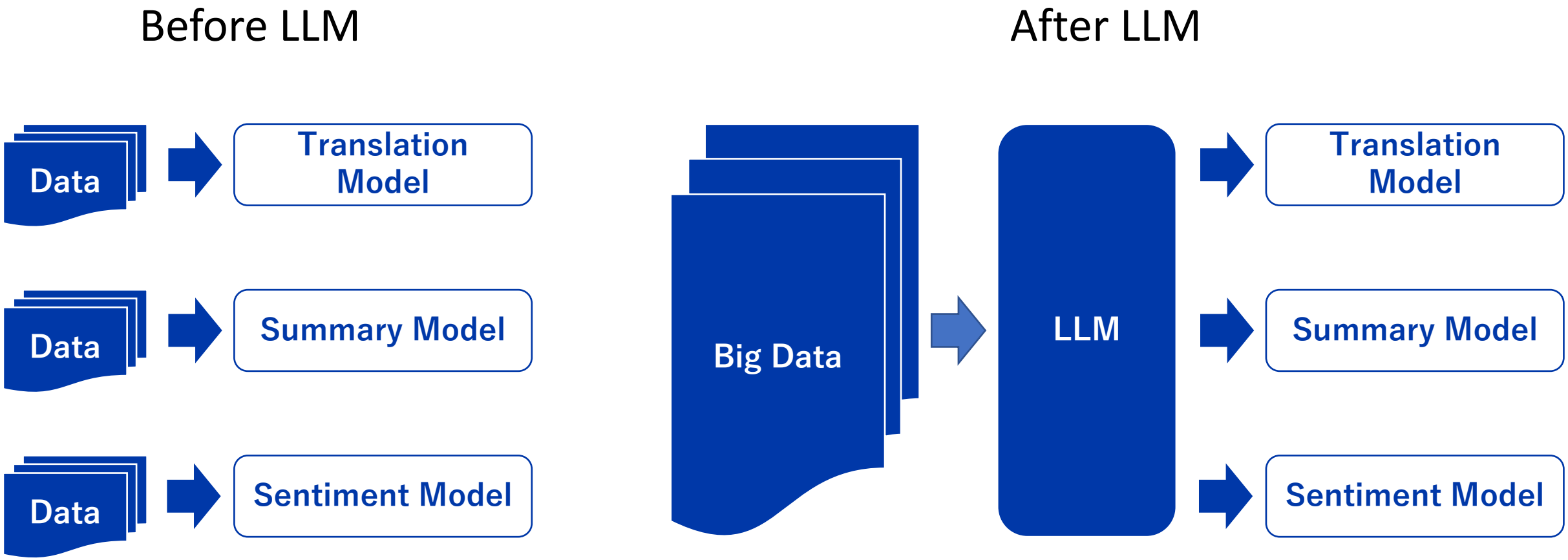
Natural language converted into vectors, enabling calculation.



King – Male + Female = Queen

Tokyo – Japan + Indonesia = Jakarta

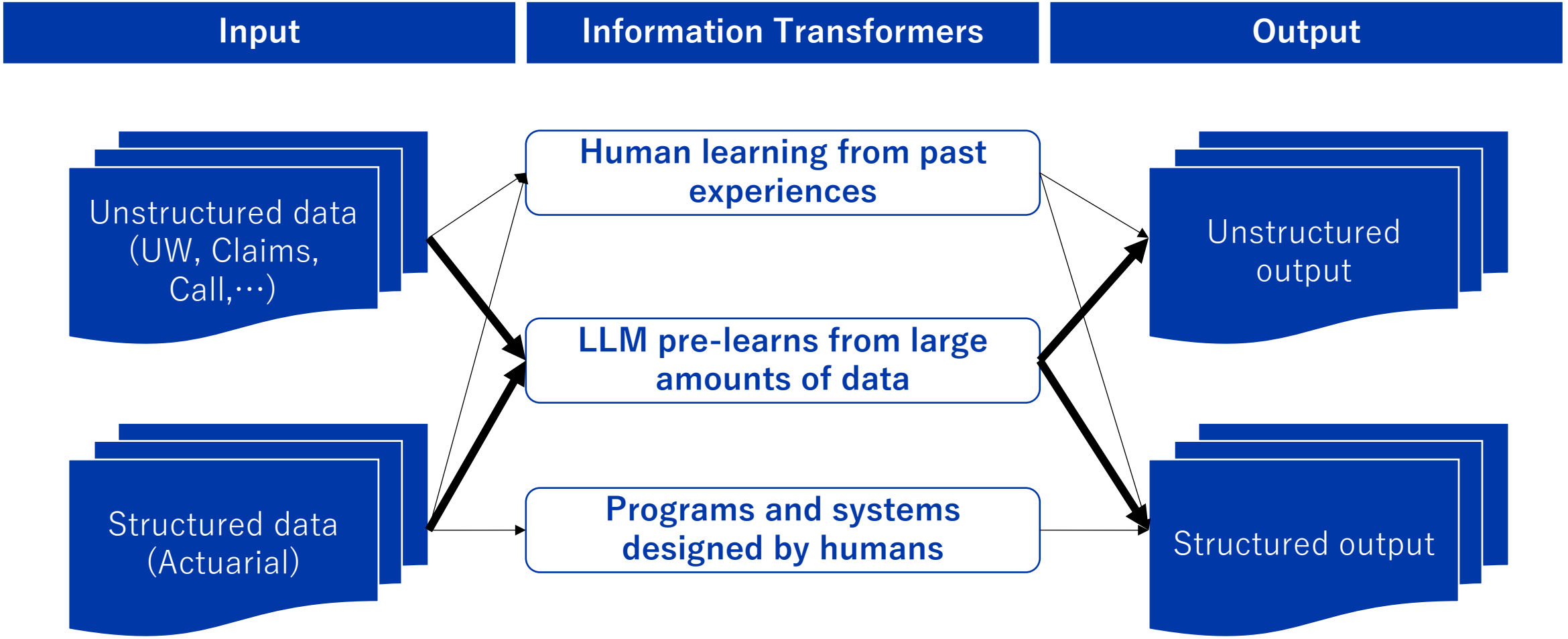
What has changed from before: versatility.



- Need task-specific models
- More data, more model parameters, more computing resources, and more and more accuracy.

LLM as information transformers

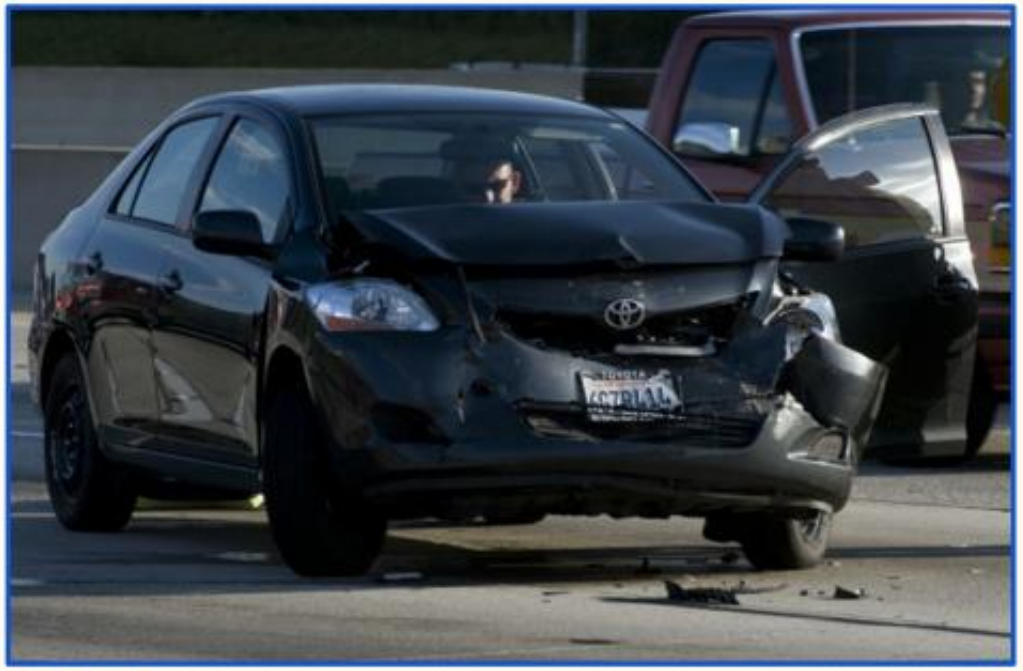
- Input and/or output are of different modalities (e.g. text-to-image, image-to-text)



LLM as information transformers

Prompt:

Imagine that you are an expert in evaluating the car damage from car accident for auto insurance reporting. Please evaluate the damage seen in the image below. For filing the incident report, please follow the following format in JSON (note xxx is placeholder, if the information is not available in the image, put "N/A" instead).
{"make": xxx, "model": xxx, "license plate": xxx, "damage description": xxx, "estimated cost of repair": xxx}



GPT-4V:

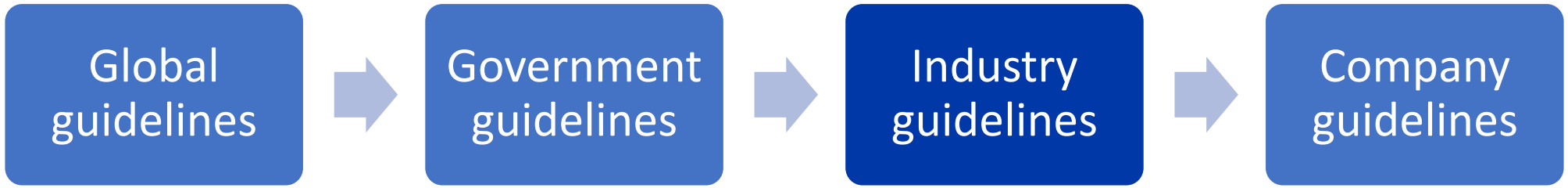
{"make": "Toyota", "model": "Corolla", "license plate": "N/A", "damage description": "Front bumper and hood damage, driver side fender damage, driver side headlight damage", "estimated cost of repair": "$2,500-$3,500"}

Source: The Dawn of LMMs: Preliminary Explorations with GPT-4V(ision)

Generative AI Guidelines for Financial Institutions

- **The Financial Data Utilization Association (FDUA)** is a Japanese industry association that promotes the effective and responsible use of financial data.

- FDUA supports financial institutions by developing **guidelines and best practices** on data governance, analytics, and the use of emerging technologies such as GenAI, with a strong focus on risk management and social trust.

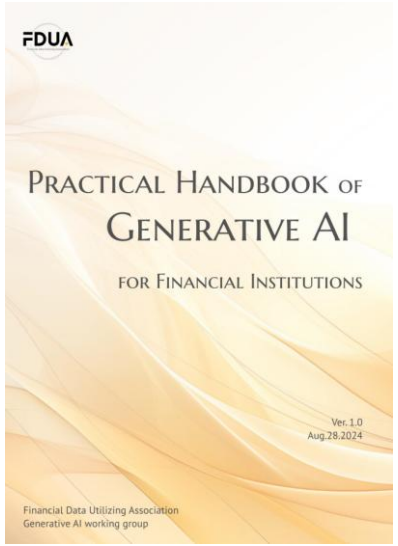


- Organizes data competitions to promote innovation, talent development, and real-world use of financial data.

- Purpose: This guideline aims to promote the innovative yet responsible use of GenAI in financial institutions. This provides guidance tailored to the financial sector, complementing Japan’s national AI guidelines and other industry standards.

- Scope: The guideline classify GenAI adoption into three levels:
  1. **Individual use** of GenAI tools for internal productivity
  2. **Enterprise use**, such as RAG-based applications leveraging internal use
  3. **Customer-facing services**, which require the highest level of governance and risk control.

Generative AI Guidelines for Financial Institutions



Level 1

- Using GenAI **within a company at an individual level**.
- Use cases: drafting documents and emails, coding, meeting minutes, etc.

Level 2

- Incorporating **internal information** through the RAG mechanism to build applications for **specific domains**.
- Use cases: drafting responses to customer inquiries, sale support, etc.

Level 3

- Providing services to **external** customers using GenAI.
- Use cases: customer inquiries support

Source: Practical Handbook of Generative AI for Financial Institutions

Use Cases

- Using GenAI within a company at an individual level.

あなたの未来を強くする
住友生命

NEWS RELEASE

2023 年 7 月 13 日
住友生命保険相互会社

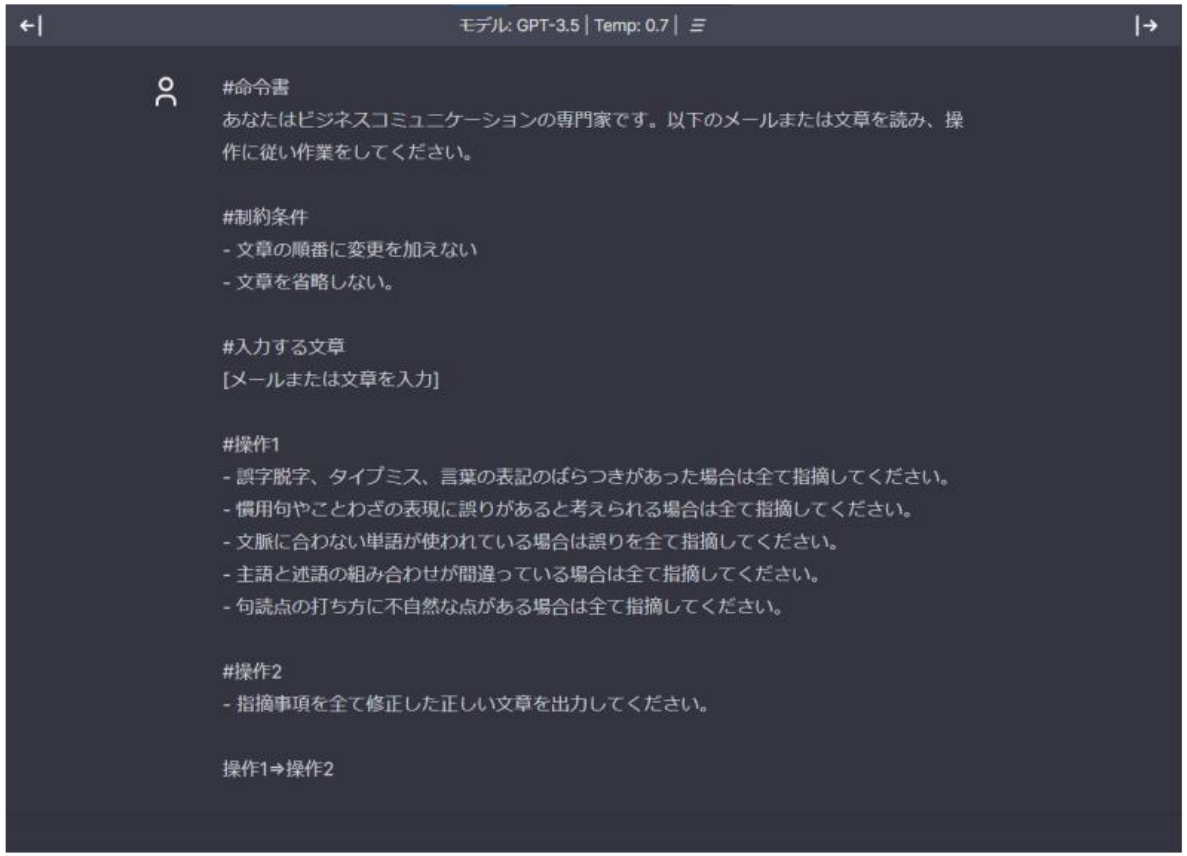
生成系 AI を活用した新たな顧客価値創造や生産性向上の取組み

～１万人の職員に導入 「人」と「デジタル」の融合で ウェルビーイングサービスの創出へ向けて加速～

住友生命保険相互会社（取締役 代表執行役社長 高田 幸徳、以下「住友生命」）は、生成系 AI チャットシステム（Sumisei AI Chat Assistant、以下「本システム」）を、７月 18 日より本社・グループ会社の職員約１万人を対象に運用開始予定です。本システムを通じて日常業務の生産性向上を図るほか、お客さま向けサービスの開発・更なるレベルアップに活用していきます。

住友生命は、「住友生命グループ Vision2030」の中で掲げる全てのステークホルダーの「ウェルビーイング※1」実現に向け、従来の保険会社の姿に留まることなく、“住友生命「Vitality」”をはじめとした、さまざまなよりよく生きるサービス「WaaS（Well-being as a Service）※2」を創出・提供することを目指しています。職員がデジタル・IT に関する知識やスキルを身に付け、さらに生成系 AI システムを活用することで、新たなウェルビーイングサービスの創出に向けた取組みを加速していきます。

＜本システムのデモ画面：プロンプトの事例＞

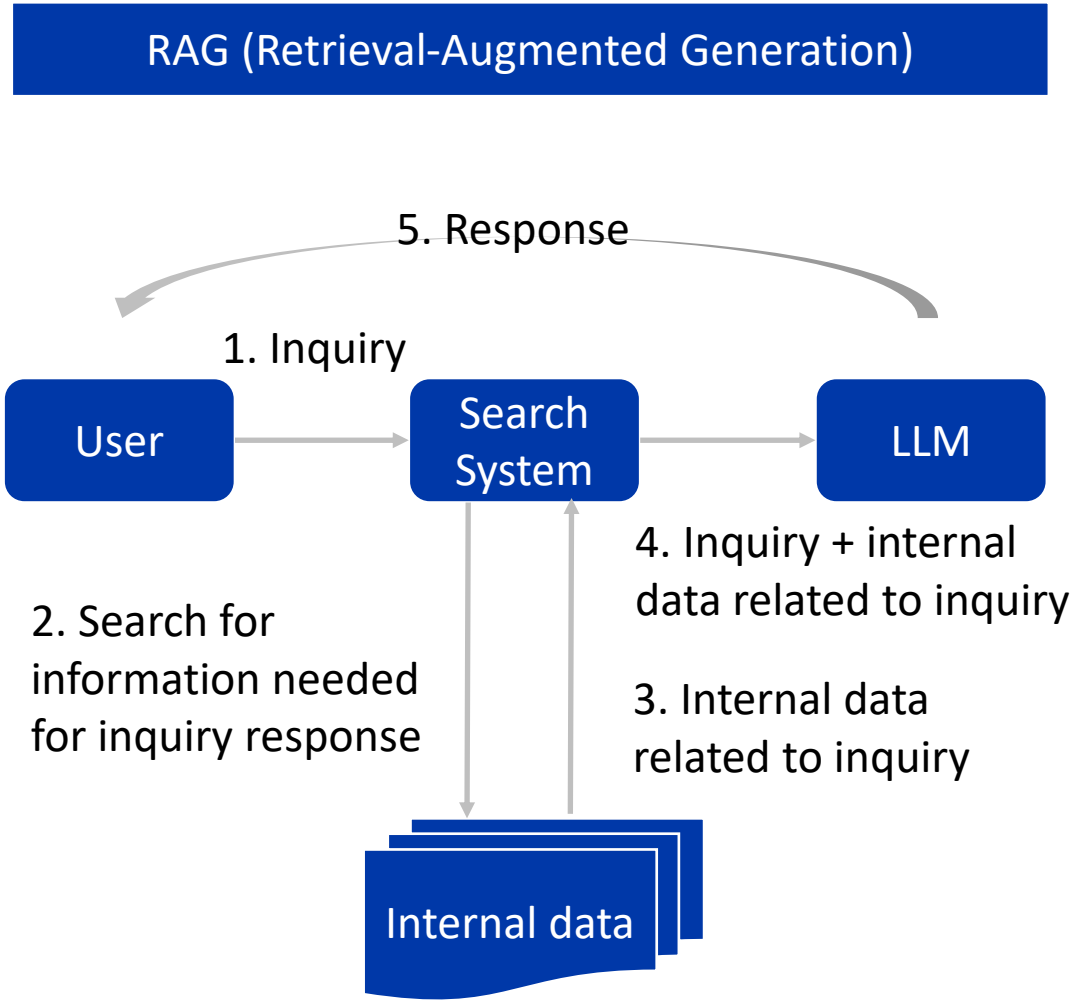


Source: Sumitomo Life

Use Cases

Challenges	Action Taken
• Simply providing tools does not lead to adoption by frontline staff.	• Held an executive briefing one month before the company-wide rollout. • Held a company-wide training session one month after the rollout. Prepared 30 business-ready prompts and introduced the 3R framework (Role, Rule, and Reference) • Afterward, conducted interviews with individual departments in advance and held tailored training sessions to address their specific challenges. • Conducted one-on-one training sessions for executives.
• The cos-effectiveness is difficult to visualize	• Calculated that the initial investment would be recovered within 3 months and reported this to management. • Continuously improved and redefined the model over time.

Use Cases



- **RAG** is a technology that enhances the quality and accuracy of outputs by adding relevant information to the input for LLMs.
- Key considerations when implementing **RAG** include:
  - Ensuring the accuracy of the added information
  - Confirming that the added information is not outdated
  - Considering search algorithms that can retrieve appropriate responses to questions, etc.

Source: Practical Handbook of Generative AI for Financial Institutions

Use Cases

＜ロープレ実施画面イメージ＞

- Sumitomo Life has upgraded its AI-based role-playing system for tied agents as part of its broader AI-driven workforce transformation initiative.
- The upgraded system uses GenAI–driven avatars to enable unscripted, realistic conversations that simulate real customer interactions. Tied agents can train across an entire consultation flow, including understanding customer needs, responding flexibly, deepening discussions, and securing follow-up appointments. After each session, the AI provides immediate, objective feedback, helping to standardize guidance and improve training efficiency.

Potential use cases

- Disease prediction model using Vitality data was released in 2023.
- Capable of assessing risk for diabetes, stroke, cardiovascular disease, kidney disease, and cancer.
- Scores vary on a weekly basis.
- Combining Machine Learning and Actuarial Science.
- Logic-based generation of comments for health, but generative AI could be used to generate more personalized comments.
- This is one of the ideas for future level ups.

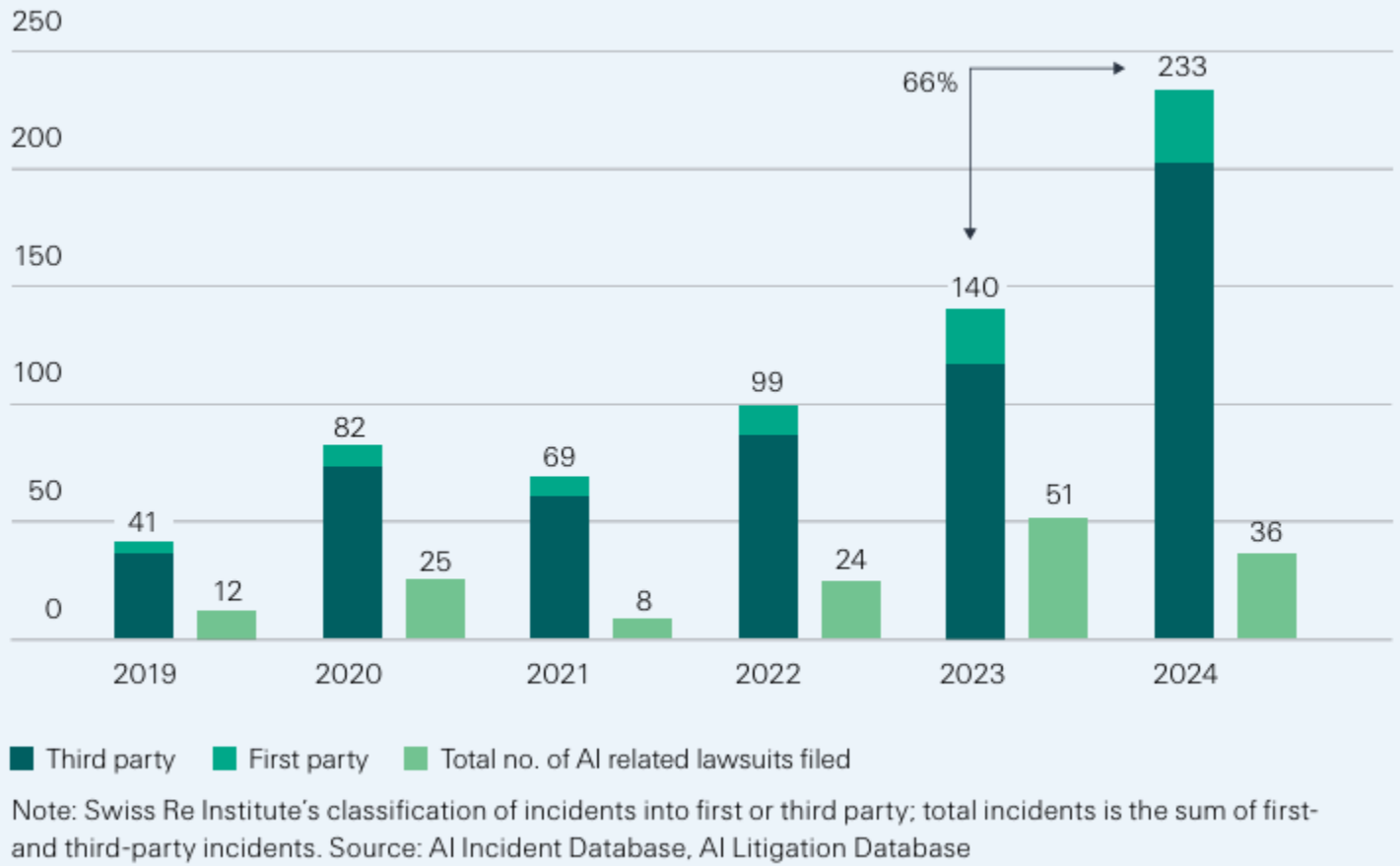
Source: Sumitomo Life

Agenda

1. Sumitomo Life: Vitality & PayPay insurance
2. Opportunities: AI and Data Science Applications
3. Risks: AI Risk Management

- AI-related incidents are increasing, with reported cases rising by more than **60% between 2023 and 2024**.
- As AI adoption expands across **individuals and organizations**, a further increase in litigation is expected.
- In particular, lawsuits related to **intellectual property infringement and defamation** have surged, including cases linked to large language models (LLMs) such as ChatGPT.

Figure 5
Number of AI incidents

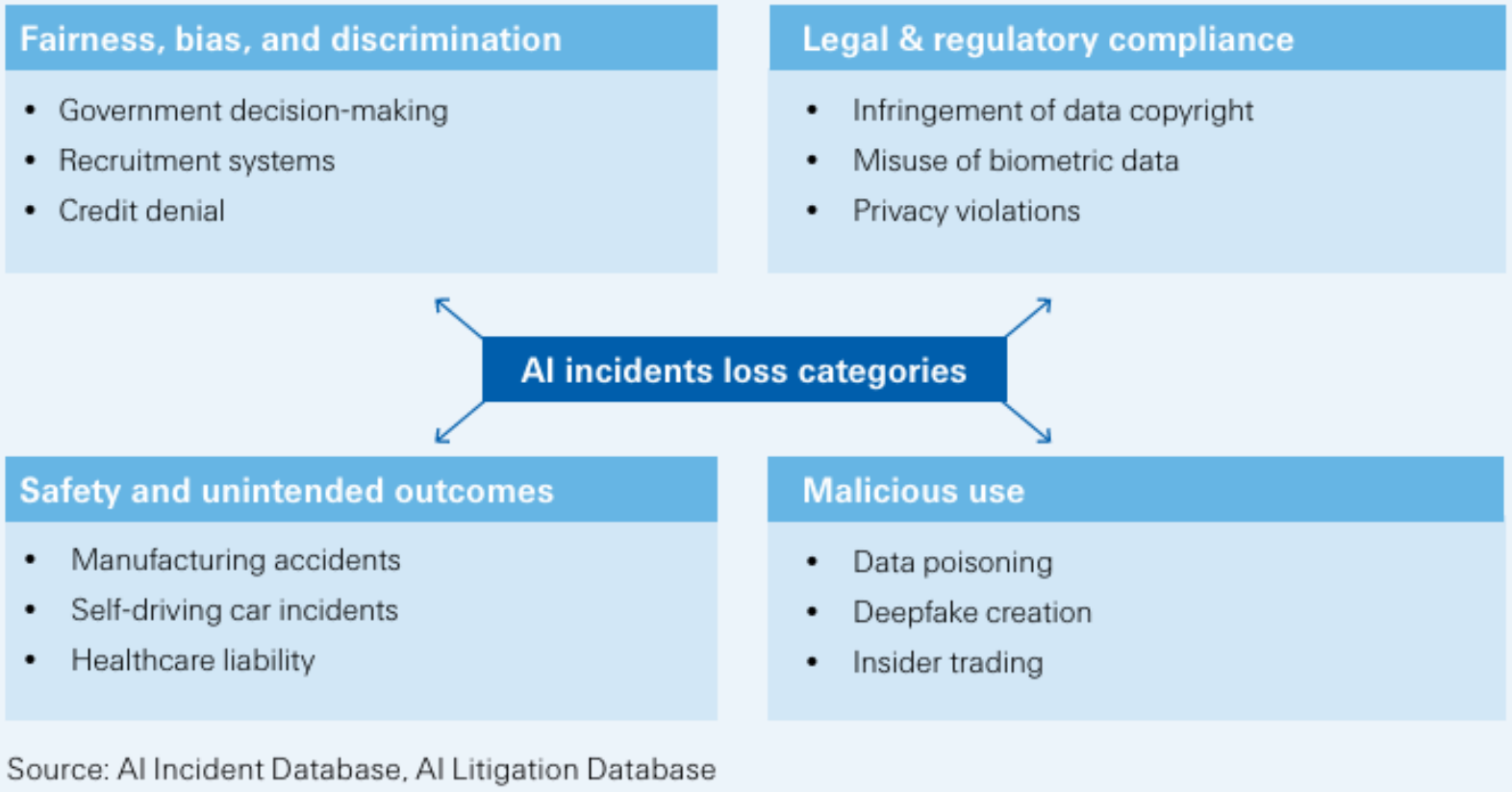


Note: Swiss Re Institute's classification of incidents into first or third party; total incidents is the sum of first- and third-party incidents. Source: AI Incident Database, AI Litigation Database

Source: Swiss Re SONAR report 2025

Major Categories of AI Risks

Figure 7
Loss drivers

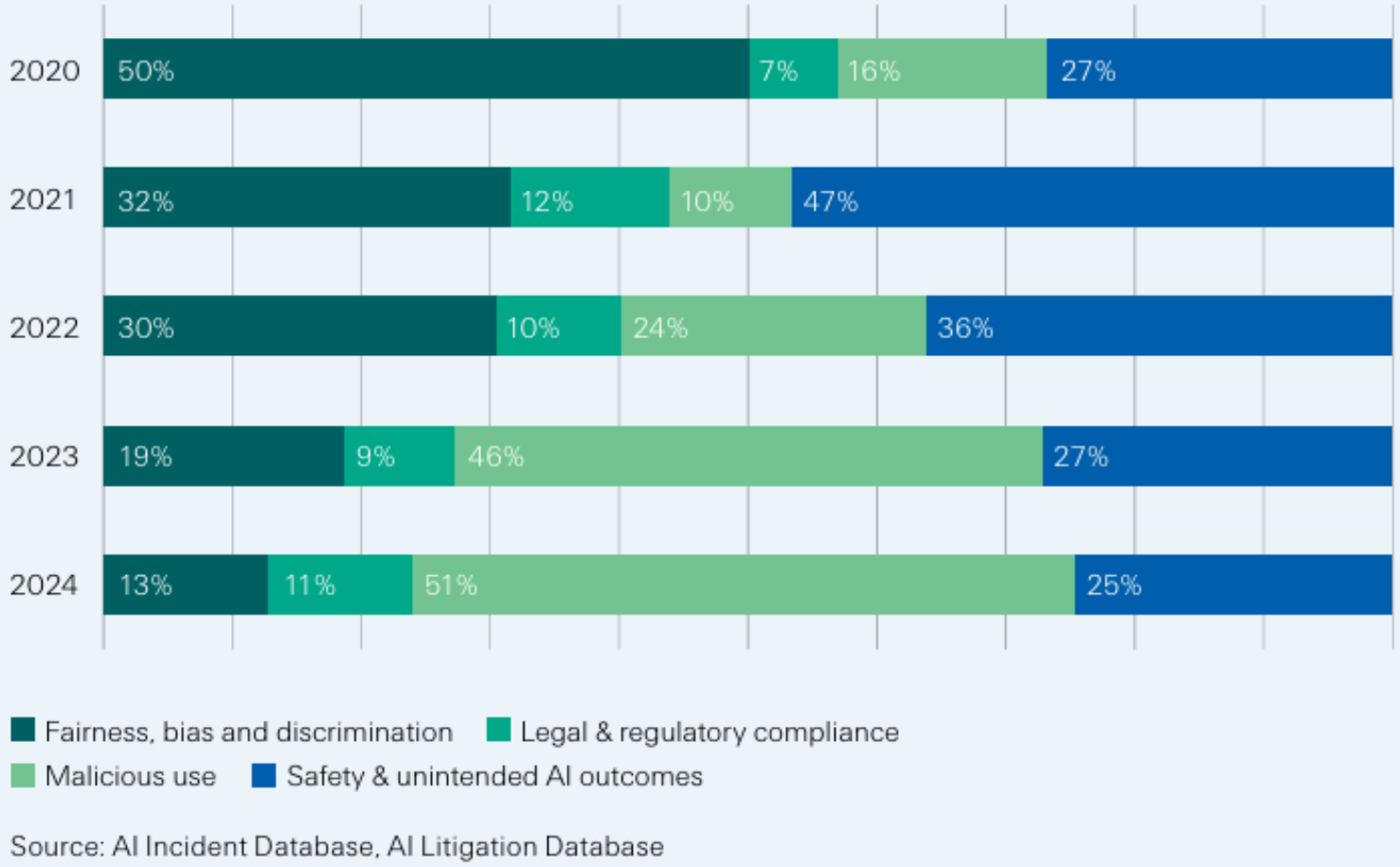


Source: AI Incident Database, AI Litigation Database

Source: Swiss Re SONAR report 2025

- While incidents related to fairness, bias, and discrimination are decreasing as a proportion of total AI incidents, **malicious use–related incidents** continue to increase.

Figure 6
Loss categories' share of total losses



Source: AI Incident Database, AI Litigation Database

Source: Swiss Re SONAR report 2025

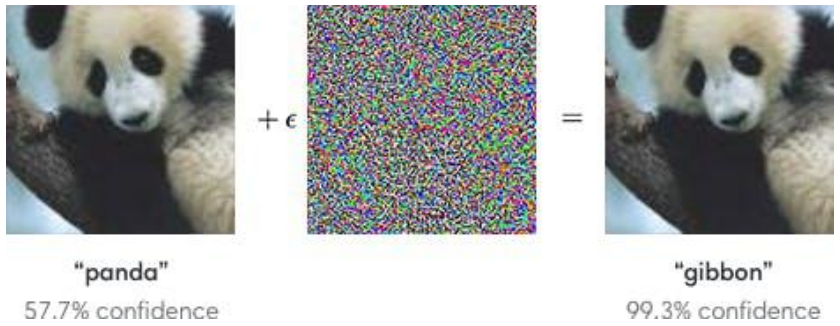
Security

Data Breach

Let's consider a case where a consulting actuary inputs the client's (Company A) corporate name and detailed information about a new product under development into **ChatGPT** to create a draft proposal. In the future, if a third party asks **ChatGPT**, "What kind of product is Company A developing?" it might respond based on the information provided by the actuary. Such an information leak poses a risk not only to the client's information security but also to the actuary's credibility.

Adversarial Attack

An **adversarial attack** is a technique used to intentionally manipulate the input to a machine learning model so that it produces an incorrect output with a high level of confidence.



Source: Attacking machine learning with adversarial examples on Open AI website

Autonomous vehicles are vulnerable to **adversarial attacks**, such as manipulating traffic signs to deceive AI systems. This can cause the vehicles to behave unpredictably and put lives at risk. There are concerns that attackers could exploit these vulnerabilities for destructive purposes beyond just traffic accidents.

Security

DeepFake

Fraudsters Used AI to Mimic CEO's Voice in Unusual Cybercrime Case

Criminals used artificial intelligence-based software to impersonate a **chief executive's voice** and demand a fraudulent transfer of €220,000 ($243,000) in March in what cybercrime experts described as an unusual case of artificial intelligence being used in hacking.

The CEO of a U.K.-based energy firm thought **he was speaking on the phone with his boss**, the chief executive of the firm's German parent company, who asked him to send the funds to a Hungarian supplier. The caller said the request was urgent, directing the executive to pay within an hour, according to the company's insurance firm, Euler Hermes Group SA.

Source: https://www.wsj.com/articles/fraudsters-use-ai-to-mimic-ceos-voice-in-unusual-cybercrime-case-11567157402

Ethical

Fairness

Lemonade Insurance faces backlash for claiming AI system could automatically deny claims

"When a user files a claim, they record a video on their phone and explain what happened. Our AI carefully analyzes these videos for signs of fraud. It can pick up non-verbal cues that traditional insurers can't, since they don't use a digital claims process," the company wrote.

"This ultimately helps us lower our loss ratios (aka how much we pay out in claims vs. how much we take in) and our overall operating costs. In Q1 2017, our loss ratio was 368% (friggin' terrible), and in Q1 2021 it stood at 71%," the company added in the now-deleted thread.

These tweets caused immediate backlash from members of the **disabled community** who questioned how an AI system would be able to determine fraud based on videos, while others **questioned the legality** of touting a system that helped save the company money by denying more claims outright.

Source:https://www.zdnet.com/google-amp/article/lemonade-insurance-faces-backlash-for-claiming-ai-system-could-automatically-deny-claims/

Accuracy

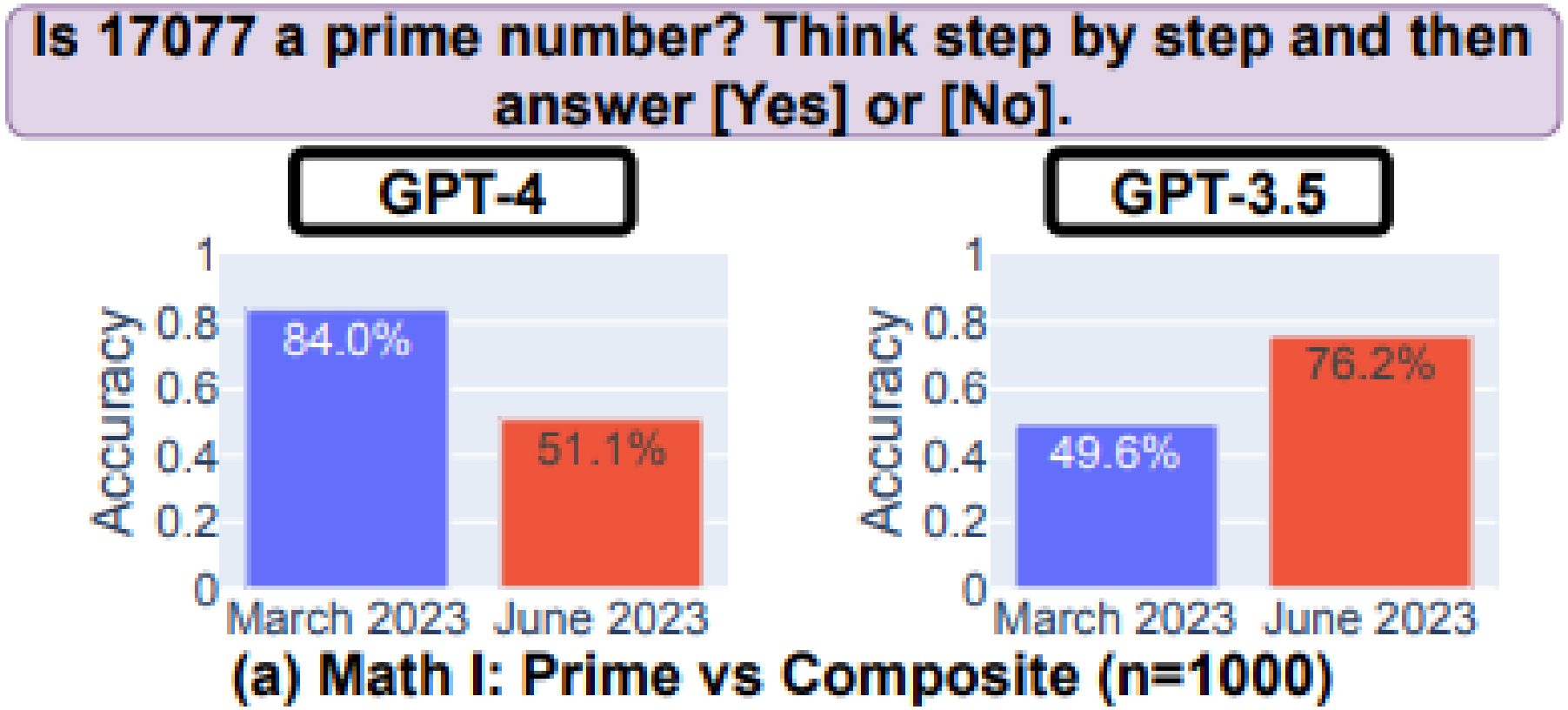
Hallucination

Hallucination in AI refers to the generation of outputs that may sound plausible but are either factually incorrect or unrelated to the given context. These outputs often emerge from the AI model's inherent **biases, lack of real-world understanding, or training data limitations**. In other words, the AI system "hallucinates" information that it has not been explicitly trained on, leading to unreliable or misleading responses.

Data Drift

Machine learning models are trained with historical data, but once they are used in the real world, they may become outdated and lose their accuracy over time due to a phenomenon called drift. **Drift** is the change over time in the statistical properties of the data that was used to train a machine learning model. This can cause the model to become less accurate or perform differently than it was designed to.

Accuracy



Source：How is ChatGPT's behavior changing over time?

EU vs Japan: AI Regulation Approach

	EU (AI Act)	Japan
Regulatory Approach	Risk-based, legally binding	Principle-based, soft law
Risk Classification	Strict risk classification, including prohibited uses	Flexible, non-binding risk considerations
Enforcement	Strong enforcement with penalties	Limited enforcement, supervisory dialogue
Governance Model	Centralized regulation	Multi-layered (government, regulator, industry)
Innovation vs. Regulations	Safety-first	Pro-innovation, pro-trust

- Japan relies on trust and distributed responsibility.
- Soft law offers flexibility and innovation, but suffers from uncertainty, weak enforcement, and potential chilling effects.

Japanese government

AI Guidelines for Business Ver.1.1 (Ministry of Economy, Trade and Industry)

Support for voluntary efforts by business operations

Show directions for AI business actors founded on the risk-based approach.

Coordination with international discussions

Ensure consistency with trends and contents of domestic and overseas relevant principles.

Understandability for readers

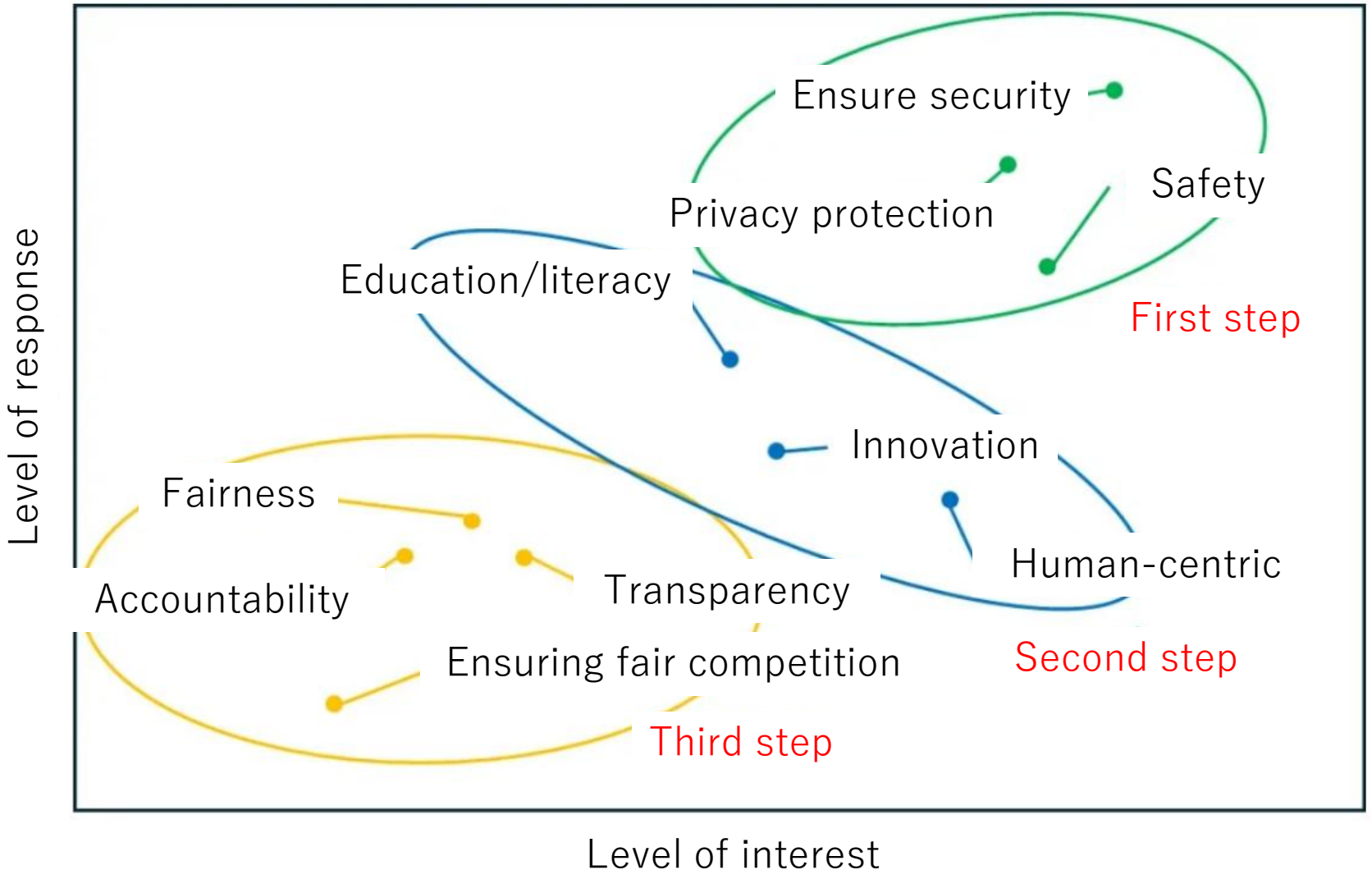
Readers can check risks and handling policies that should be considered regarding AI, for each of AI developers, AI providers, and AI business users.

English version is available on https://www.meti.go.jp/shingikai/mono_info_service/ai_shakai_jisso/20240419_report.html

Social Principles of Human-Centric AI (Cabinet Office)

- Human-centric
- Education/literacy
- Privacy protection
- Ensuring security
- Fair competition
- Fairness, Accountability, and Transparency
- Innovation

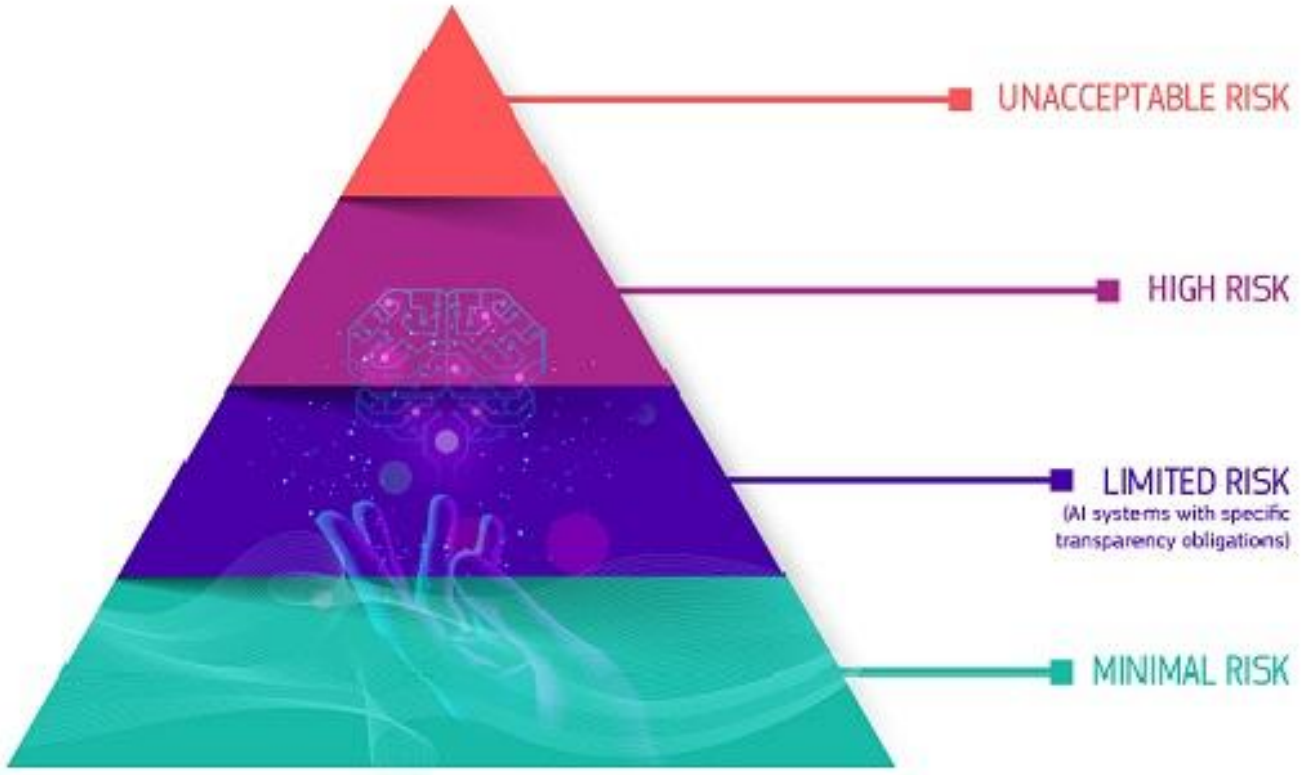
Level of interest and response of financial institutions to the AI principles



Source: Results of FDUA member survey

AI regulation by European Commission

EU parliament vote to adopt World's first comprehensive rulebook on 11th May 2023. The proposed regulation aims to make **AI system** safer and ensure the protection of individual's rights.



Source: https://digital-strategy.ec.europa.eu/en/policies/regulatory-framework-ai

AI regulation by European Commission

Definitions
For the purpose of this Regulation, the following definitions apply:

'artificial intelligence system' (AI system) means software that is developed with one or more of the techniques and approaches listed in Annex I and can, for a given set of human-defined objectives, generate outputs such as content, predictions, recommendations, or decisions influencing the environments they interact with;

ANNEX I
ARTIFICIAL INTELLIGENCE TECHNIQUES AND APPROACHES
referred to in Article 3, point 1

(a)**Machine learning approaches**, including supervised, unsupervised and reinforcement learning, using a wide variety of methods including deep learning;
(b)**Logic- and knowledge-based approaches**, including knowledge representation, inductive (logic) programming, knowledge bases, inference and deductive engines, (symbolic) reasoning and expert systems;
(c)**Statistical approaches, Bayesian estimation, search and optimization methods**.

AI regulation by European Commission

insurance europe

Position paper

Response to EC proposal for a Regulation on AI

Our reference:	COB-TECH-21-083
Referring to:	EC public consultation on its proposal for a Regulation on AI
Related documents:	
Contact person:	Arthur Hilliard Senior Policy Advisor, Conduct of
Pages:	2

The definition of an AI system as currently proposed in Article 3 of the draft Regulation, however, significantly widens the OECD definition by also including software within its scope. This will result in the inclusion in its scope of systems, techniques and approaches that should not be considered as AI and will generally create confusion and a lack of legal certainty. For example, **the use of statistical output from a linear regression model in the actuarial function would be covered by this proposed definition**, as would statistical approaches such as exploratory data analysis that mostly involves using graphical techniques to analyse datasets, or task allocation systems that form part of the back-office functions of companies.

Guidelines for Business Ver 1.0 in Japan

AI

No agreed definition has been existed as of now, and it is difficult to strictly define artificial intelligence in a broad sense. AI in the Guidelines is an abstract concept, which includes AI systems themselves or software or programs that perform machine learning.

AI system (such as a machine, robot, and cloud system) that works at various levels of autonomy during the use process and incorporates a software element that has a learning function.

AI model (ML model)

A model incorporated into an AI system and acquired through machine learning using training data. It produces prediction results in accordance with the input data. (For reference, it is defined in JIS X 22989:2023 based on ISO/IEC 22989:2022 as follows.)

A mathematical structure that produces inferences or predictions based on input data or information.

Example: When a univariate linear function $y = \theta_0 + \theta_1 x$ is trained using the linear regression, the result model is $y = 3 + 7x$ or the like.

Note 1: A machine learning model is acquired as a result of training based on a machine learning algorithm

Horizontal vs. Vertical Principle/Guideline

Horizontal

- Rules that apply to the use of AI in any sector.

Examples:

1. **Social Principles of Human-Centric AI** (Cabinet Office, Government of Japan, 2019)
   - The Human-Centric Principle
   - The Principle of Education/Literacy
   - The Principle of Privacy Protection
   - The Principle of Ensuring Security
   - The Principle of Fair Competition
   - The Principle of Fairness, Accountability, and Transparency
   - The Principle of Innovation
2. **AI Guidelines for Business ver1.1** (Ministry of Internal Affairs and Communications & Ministry of Economic, Trade and Industry, 2025)

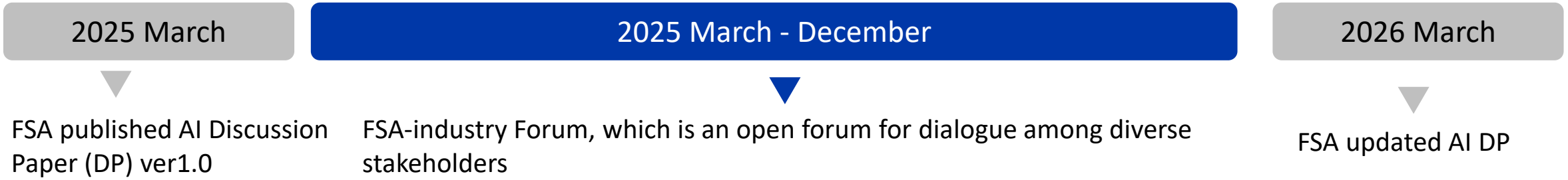
Vertical

- Rules tailored to a specific industry, reflecting its unique risks and social responsibilities.

Examples:

1. **AI Discussion Paper** (Financial Services Agency, 2025)
   - Recognizing the **"risk of inaction“**
2. **Generative AI Guidelines for Financial Institutions** (Financial Data Usage Association, 2024)
3. **AI Governance Framework** (International Actuarial Association, 2025)

FSA: AI Discussion Paper

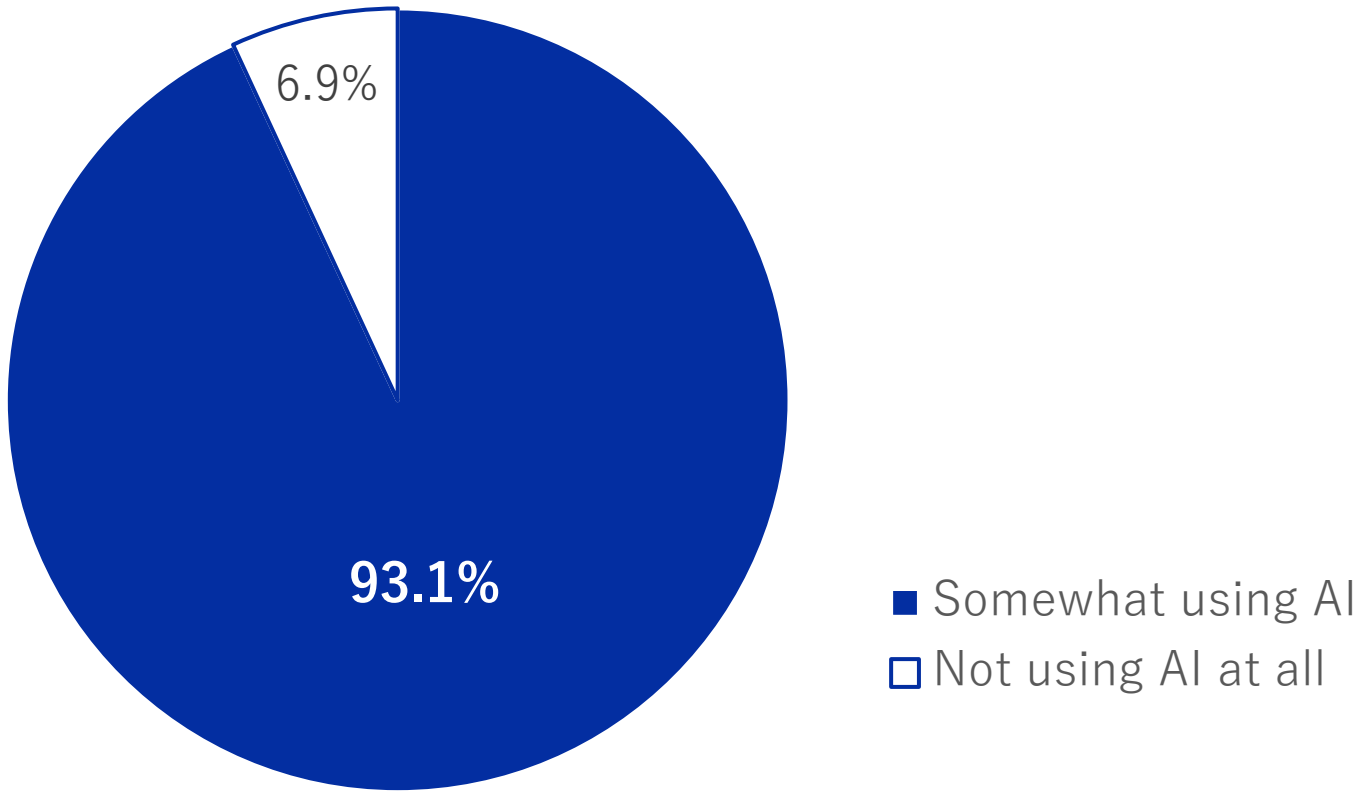


Background and key issues

- The DP clearly sets out a policy to **actively promote the sound use of AI** by financial institutions.
- Going forward, in considering the provision of **safe harbors through clearer regulatory applicability**, it is necessary to **deepen the initial issues identified in the DP** and translate them into concrete policy measures.
- In addition, to support financial institutions in **steadily advancing AI initiatives**, it is important to **share use cases and practical approaches to governance**, as strongly requested in post-DP feedback.

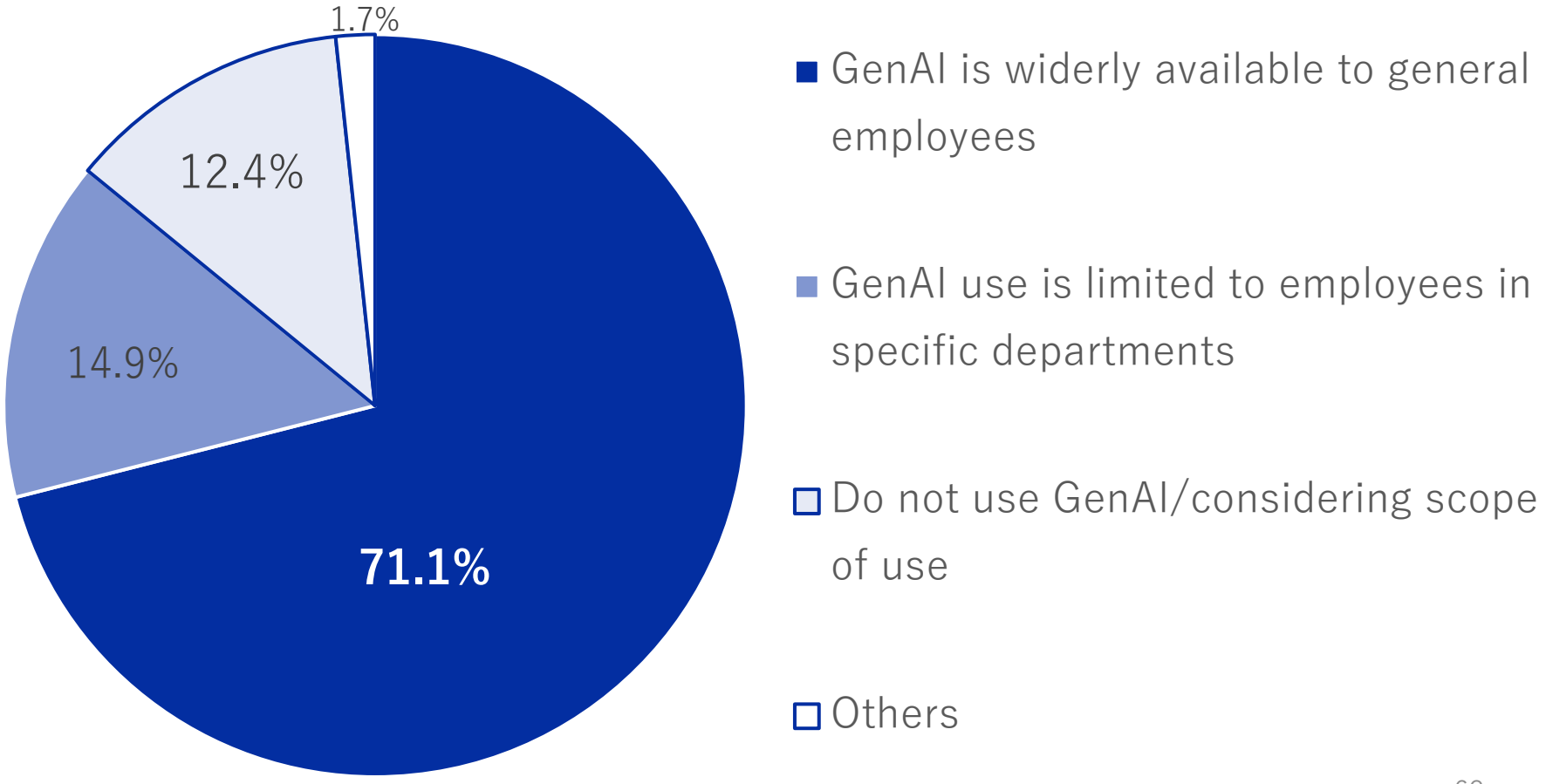
FSA: AI Discussion Paper

- Questionnaire Survey on the Status of use of AI by Financial Institutes (40.0% for banks, 16.9% for securities firms and **11.5% for insurance companies**)
- **Over 90%** of respondents already use conventional AI or generative AI.



FSA: AI Discussion Paper

- **Approximately 70%** of Financial Institutions broadly allow the use of generative AI for general employees.
- Utilization is expanding through internal study sessions and idea contests.



FSA: AI Discussion Paper

Internal use

- Currently, many financial institutions remain here.
- Use cases such as **document summary/translation, editing and evaluating of documents, internal FAQs, and system development/testing**.
- More than half of respondents said that they would consider using it for customer services in the future.

Indirect utilization in customer service

- Many companies have already introduced GenAI into customer-facing services. However, due to risks, GenAI outputs are generally not presented directly to customers, and most use cases involve human judgment.
- Use cases such as **call center operations support, preparation of documents, and draft of external documents**.

Direct utilization in customer service

- This is **very limited** due to risks such as hallucination.

FSA: AI Discussion Paper

Common challenges for conventional AI and GenAI

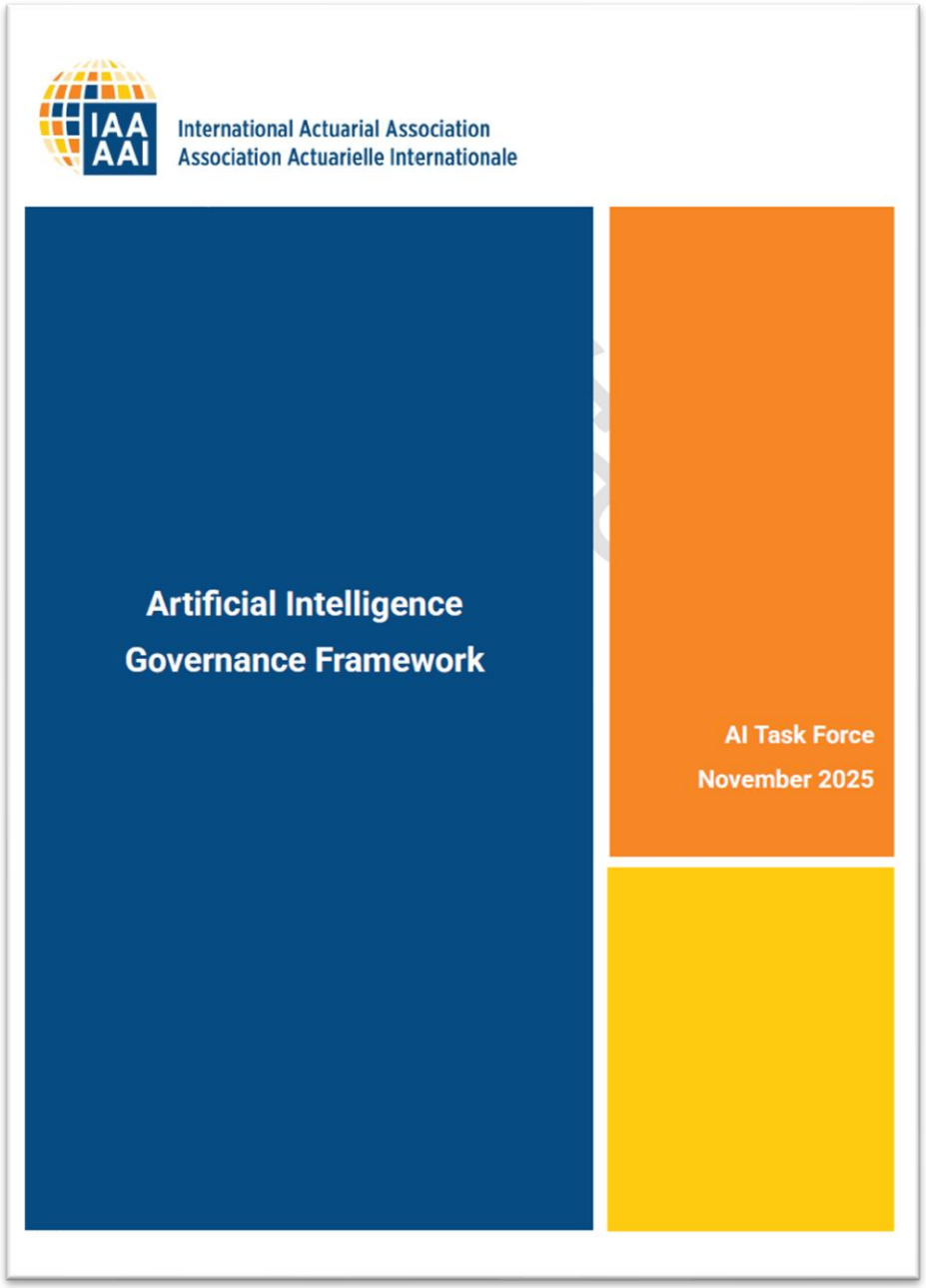
- Data preparation
- Collaboration with external vendors and risk management
- ROI (Return On Investment)

Issues made difficult by GenAI

- Accountability and Fairness/bias
- Development and operation of AI systems, and model/risk management
- Protection of personal information/Information Security and Cybersecurity
- Hiring of AI experts and training of employees

New challenges created by GenAI

- Hallucination
- Misuse of generative AI for financial crime
- Other issues concerning financial system stability



- Purpose: To provide educational guidance to support the responsible design, development, implementation, and the use of AI in actuarial tasks

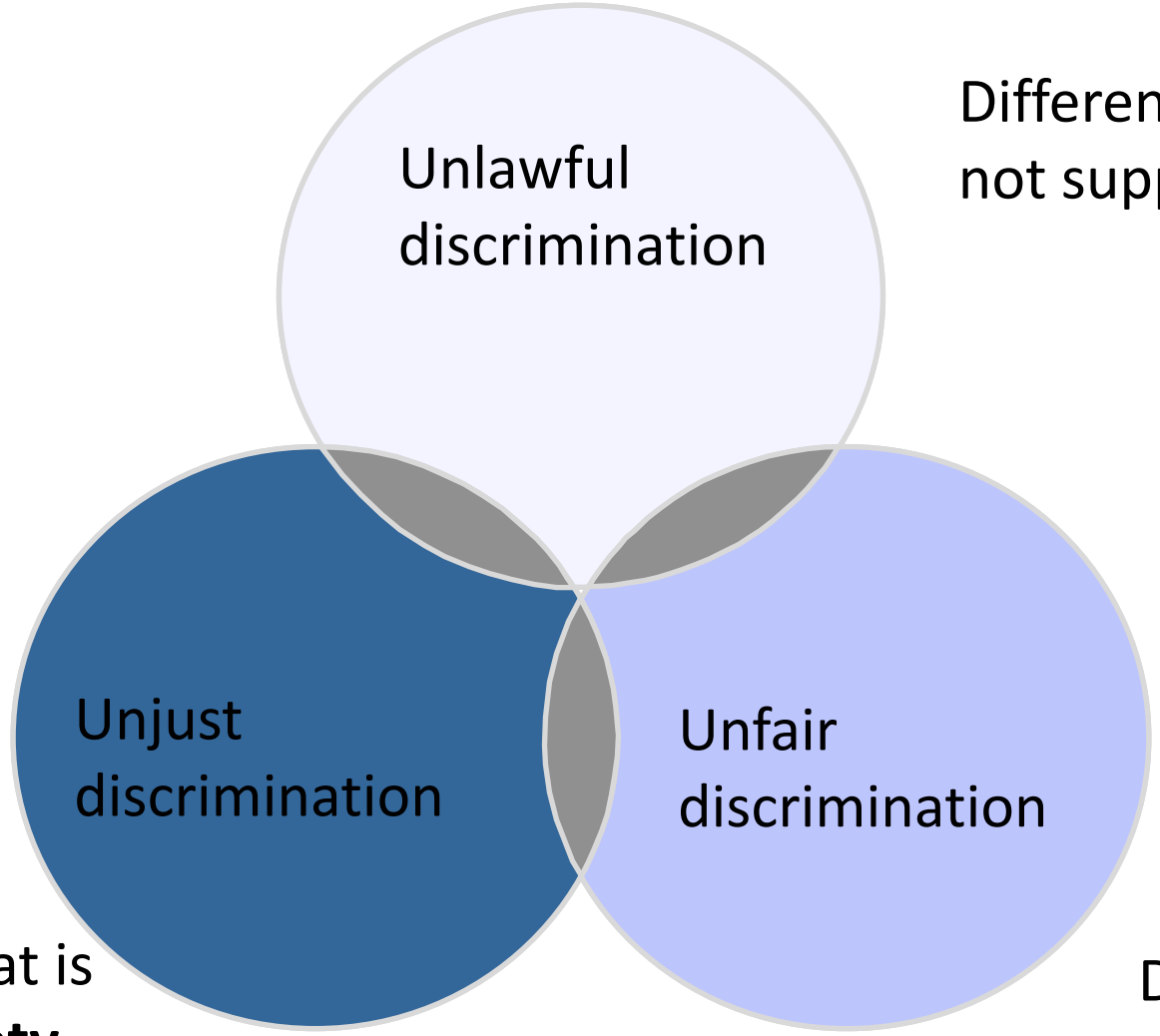
- Scope:
  1. Applies to actuaries in actuarial work using AI.
  2. Covers AI models and AI systems across the full lifecycle.
  3. Applicable to both internally developed and third-party AI systems.
  4. Intended for use across industries (not limited to insurance)
  5. Serve as an educational supplement to existing model governances, data governances, and international AI governance frameworks.

IAA: AI Governance Framework

- AI is increasing used in underwriting decision support and automation
- UW directly affects customers and therefore tends to be high-risk.

Fairness and Non-discrimination	• Ensure UW models do not introduce direct or indirect discrimination. • Particular care is required regarding protected characteristics and proxies.
Data governance	• Data used for UW must be appropriate, representative, and free from undue bias. • Heighten scrutiny is required where AI impacts consumer directly
Human oversight	• Full automation may not be appropriate • Human review or intervention may be required, especially for high-impact UW decisions
Model risk management	• UW AI models are likely classified as medium to high risk. • Stronger validation, approval, and ongoing monitoring are expected.

IAA: AI Governance Framework



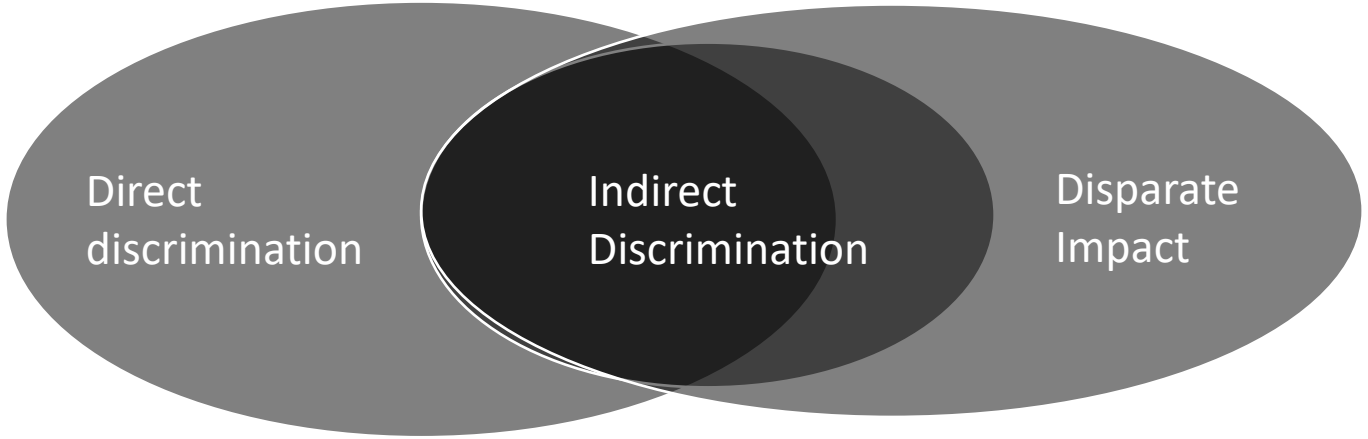
Different treatment that is not supported by **law**

Different treatment that is not supported by **society**

Different treatment that is not supported by **statistics**

IAA: AI Governance Framework

- **Direct discrimination**：Intentional and unlawful discrimination in which individuals belonging to protected characteristics (e.g. race, gender) are treated differently from others explicitly because of those characteristics.
- **Indirect discrimination**：Discrimination arising from practices that appear neutral but, in practice, disadvantage individuals with certain protected characteristics. This may occur through the use of proxy variables (e.g. residential location, occupation, purchasing history) rather than the protected characteristics themselves.
- **Disparate impact**：A situation where facially neutral policies or practices unintentionally result in disproportionate adverse effects on individuals with certain protected characteristics, even in the absence of discriminatory intent.



Use cases

- Several Japanese life insurance companies use AI in UW, not to replace underwriters, but **to support and enhance underwriting decisions**.

- This cautious approach reflects the high risk associated with AI-driven UW particularly in terms of fairness and discrimination, data governance, human oversight ant model risk management.

- A key challenge is the lack of established monitoring methodologies for underwriting AI. Monitoring needs to cover not only model accuracy, but also fairness and bias.

- One potential solution is provided by the monitoring approach adopted in Singapore, which offers a more structural framework for ongoing AI oversight.

AI and the Future of Life Insurance

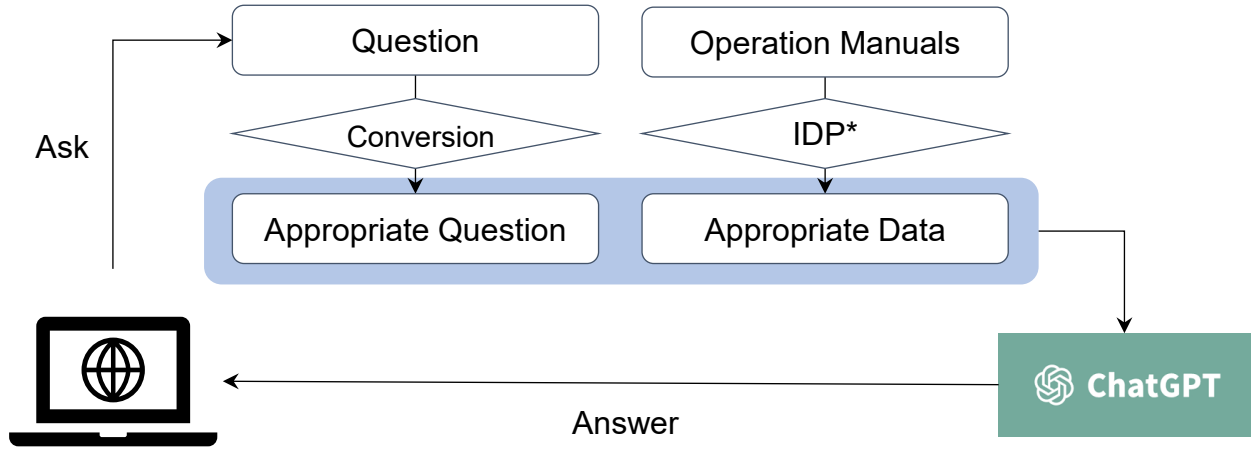
Narrow AI

- 2018: Vitality insurance launch (comprehensive health & wellness product)
- From Protection to Prevention
- 2020: Data analytics team set up
- 2023: Disease risk model developed (see below)
- 2024: Quantifying the impact of Vitality
  - Academic paper and white paper

「糖尿病・脳卒中・心血管疾患・腎臓病・がん」のリスク評価を確認出来ます。

Nov, 2022
ChatGPT

Personalized Recommendation



*Intelligent Document Processing

General AI

- Internal ChatGPT rolled out in July 2023
- Customized Prompt Engineering Training to solve problems in each department:
  - 3Rs（**R**ole, **R**ule, **R**eference）
  - Integrating GPT-4
  - Adding Bing Search
  - Introducing file upload features
- RAG to incorporate internal data (see above)
- Developing AI governance framework