



Assessing NAIC climate risk disclosure data

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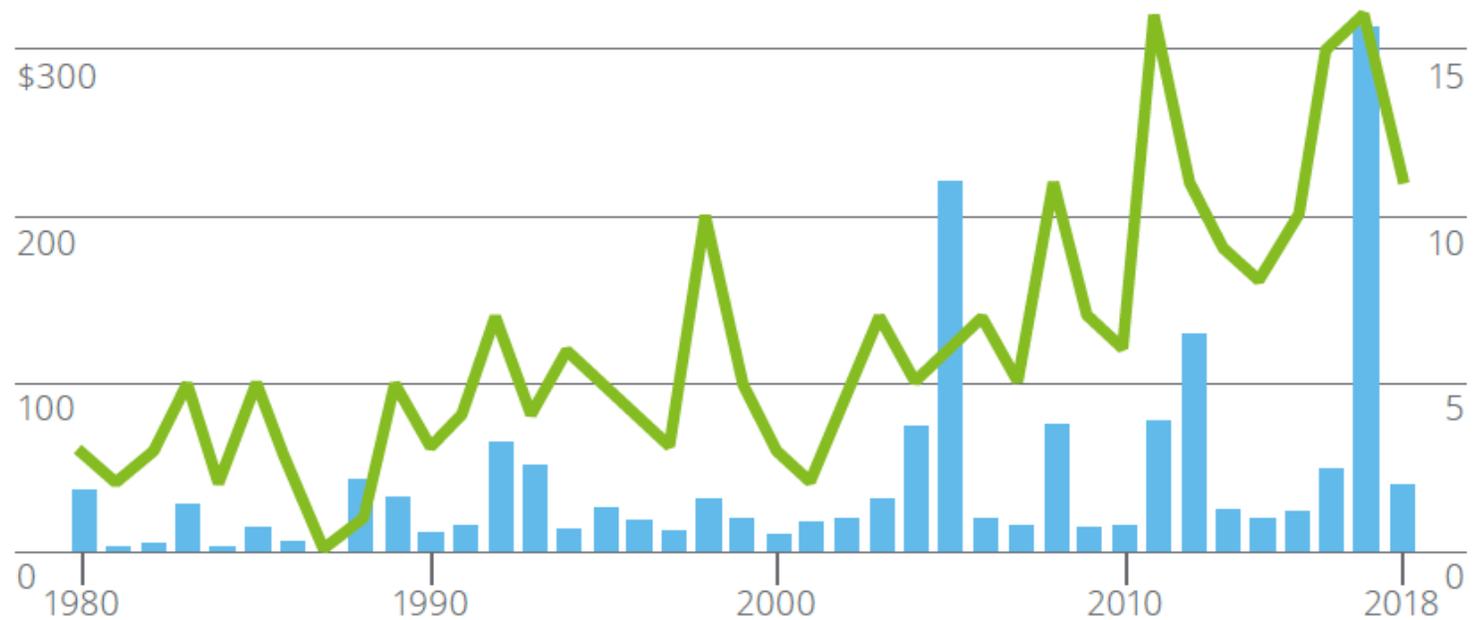
Why does climate risk matter to insurance?

Human and economic costs of climate-related natural disasters increasing steadily in both frequency and severity:

Worldwide in 2019: 9,000 deaths from natural catastrophes; \$150B in overall losses

2018: 15,000 deaths; \$186B in losses

- Losses stress insurer solvency
- Some insurance becoming less affordable & available for consumers



US billion-dollar disaster events, 1980-2018

■ Number of events ■ Total cost in billions

Source: BlackRock Investment Institute, with data from NOAA National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters, October 2018 via Deloitte Center for Financial Services *Climate risk: Regulators sharpen their focus. Helping insurers navigate the climate risk landscape*



Who cares about climate risk disclosures?

Stakeholders want to know how insurance companies manage climate risk.

Disclosures provide key information to:

- Regulators
- Insurance consumers
- Asset managers
- Environmental groups

NAIC has **renewed & strengthened** its climate risk commitment with new Climate and Resiliency (EX) Task Force

NAIC Climate Risk Disclosure Survey

- Adopted by NAIC in 2010
- Administered by California DOI
- NAIC no longer “owns”
- Six states currently participate
 - CA, CT, MN, NM, NY, WA
- Threshold: write \$100 million in premiums (others participate too)
- 1,000+ companies participate
- Represents ~70% of U.S. insurance market (direct premiums written)



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NAIC Climate Risk Disclosure Survey

The Insurer Climate Risk Disclosure Survey, adopted by the NAIC in 2010, was designed to be an insurer reporting mechanism that would provide regulators with a window into how insurers' across all lines of insurance assess and manage risks related to climate change. The eight-question survey asks insurers to provide a description of how they incorporate climate risks into their mitigation, risk-management and investment plans. Insurers are asked to identify steps taken to engage key constituencies and policyholders on the topic of climate change.

All of the states were to administer the survey to their domestic insurance companies that write more than \$500 million in direct premium. Approximately two dozen states surveyed their companies, and the data was aggregated. In 2011, the threshold was lowered to all companies writing \$300 million in premium, however, California was the only state to continue to survey its insurance market. In 2012, California, along with New York and the state of Washington, began administering the Survey to all insurance companies licensed in these states, and that write at least \$300 million, making the survey mandatory and the results public. In 2013, the threshold was lowered to \$100 million and since then, the multi-state group has expanded to include Connecticut, Minnesota, and New Mexico.

Presently, we survey more than 1,000 companies capturing more than 70% of the entire U.S. insurance market, allowing regulators, insurance companies and interested members of the public the ability to identify trends, vulnerabilities and best practices by the insurance industry with respect to climate change. The Survey results are maintained here on the California Department of Insurance's web site and can be accessed below.

insurance.ca.gov

NAIC Climate Risk Disclosure Survey

Survey questions

1. Plan to assess emissions
2. Policy re: risk management
3. Process for identifying risks
4. Risks posed by climate change
5. Investment strategy
6. Policyholders—reduce loss
7. Engage constituencies
8. Action to manage risks

** 5 of the 8 are statements, not questions*



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A lot of information

2018 survey responses
= nearly 500,000 words

NAIC & The CENTER
National Association of for INSURANCE
Insurance Commissioners POLICY
and RESEARCH

- How do insurers across lines of business **assess & manage** risks related to climate change?
- How have these responses **changed** over the past 10 years?
- What insights can be gleaned from examining the data using **text-based analysis**?

** This analysis is not designed to assign “scores” to individual insurers*



Research questions

1. **Quantitative:** Statistics of 8 yes/no survey questions
2. **Natural Language Processing:** Exploratory data analysis
3. **Qualitative:** Thematic analysis of open-ended responses to the same 8 questions to identify patterns of meaning

Multiple methods approach

- Answers to 8 yes/ no questions
- First set of charts: 2018 sliced & diced
 - Required to respond
 - Part of a group
 - Unique response
 - Line of business
 - Premium
- Second set: changes over time



Photo by [Natalie Rhea Riggs](#) on [Unsplash](#)

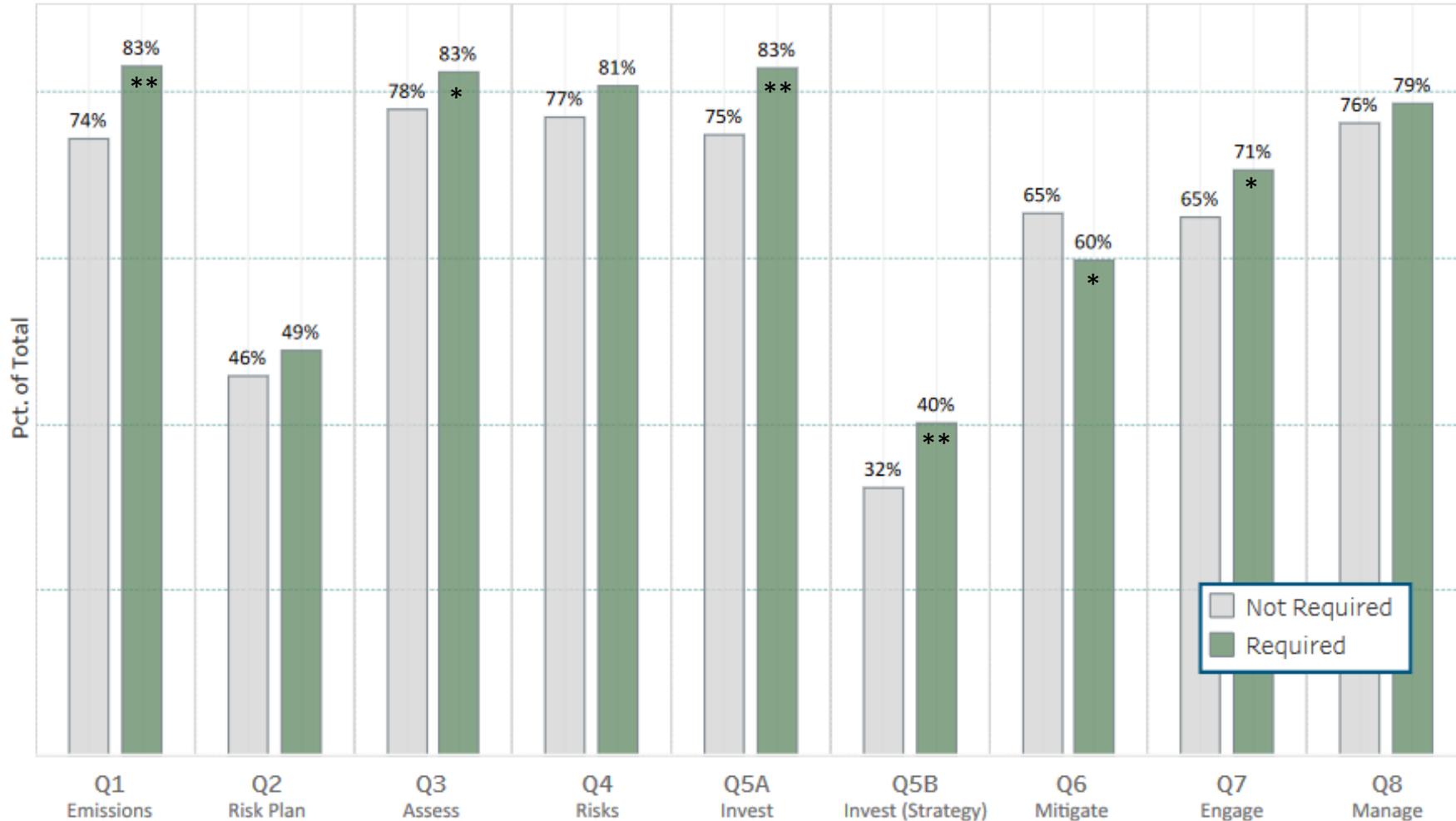
Quantitative: Yes/No questions

Required to respond

- **431** insurers required to respond in at least one state
- **815** responders not required to file
- Insurers required to respond → significantly more **Yes answers**

Is there a difference between companies that were required and not required to respond?

Companies having at least \$100 million in premium for any of the six sponsoring states were required to respond.



Not required (n = 815) and Required (n = 430)

** P < .01; * P < .05

Required to respond

Companies required to respond showed biggest differences in:

- Plan to assess company's emissions
- Change in investment strategy based on climate risk

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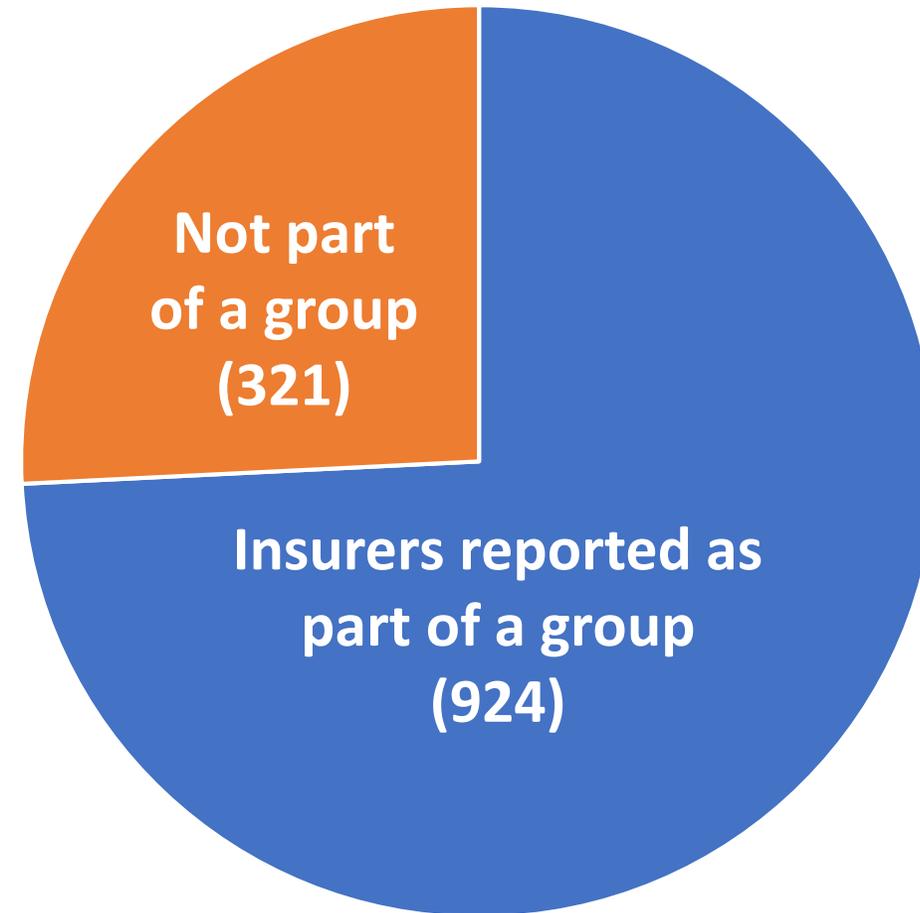


Not required (n = 815) and Required (n = 430)

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Group vs. not part of a group

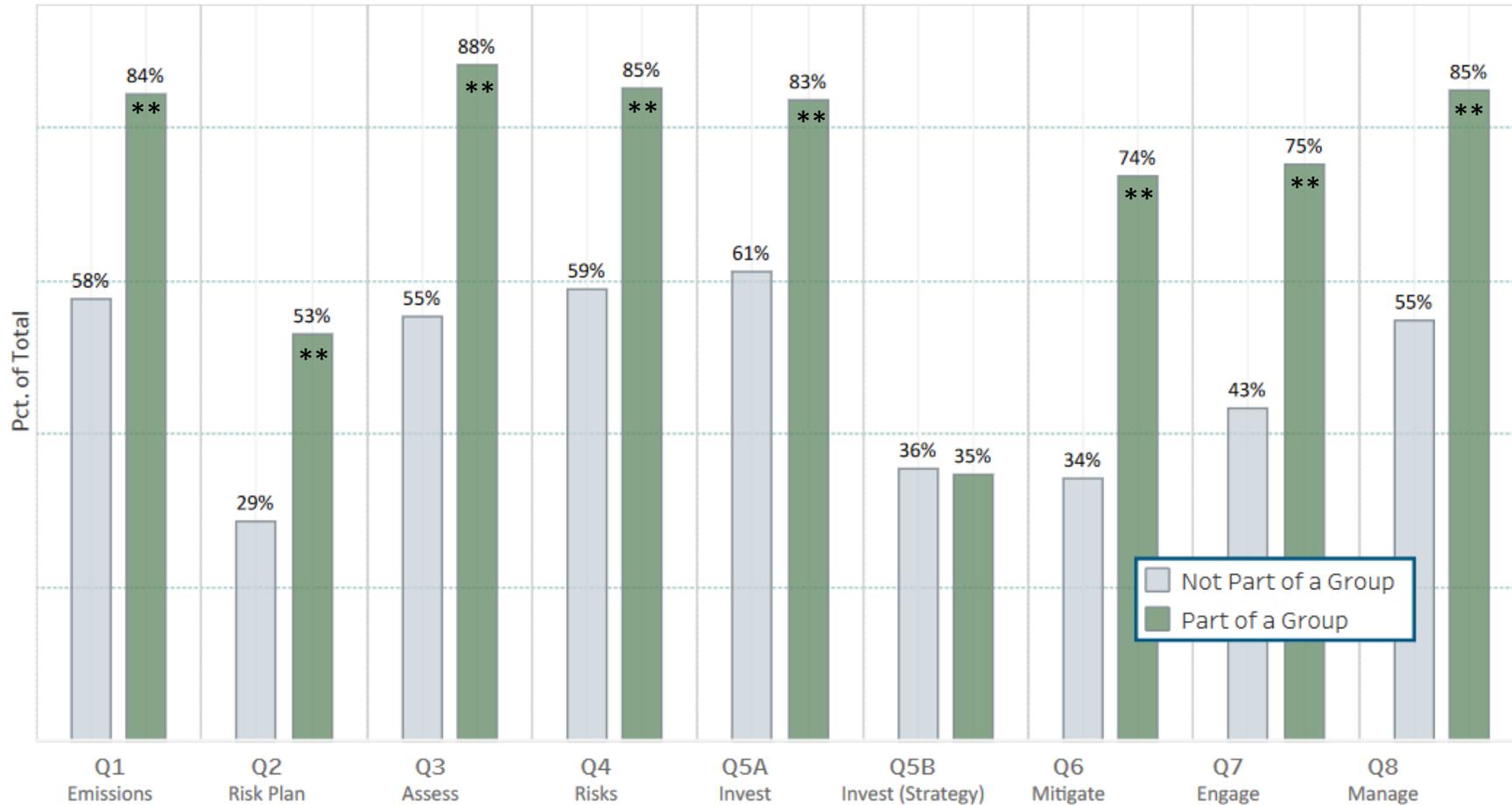
- Most insurers reported as part of a group: **924** companies versus **321**
- If each entity in parent company filed, this resulted in multiple identical surveys, inflating overall responses



Unique responses vs. groups

- Therefore, we looked at **unique responses** -- one from each overall group or individual company
- Differences are even **more pronounced & nearly universally significant**

Is there a difference between companies that are part of a group and not part of a group?



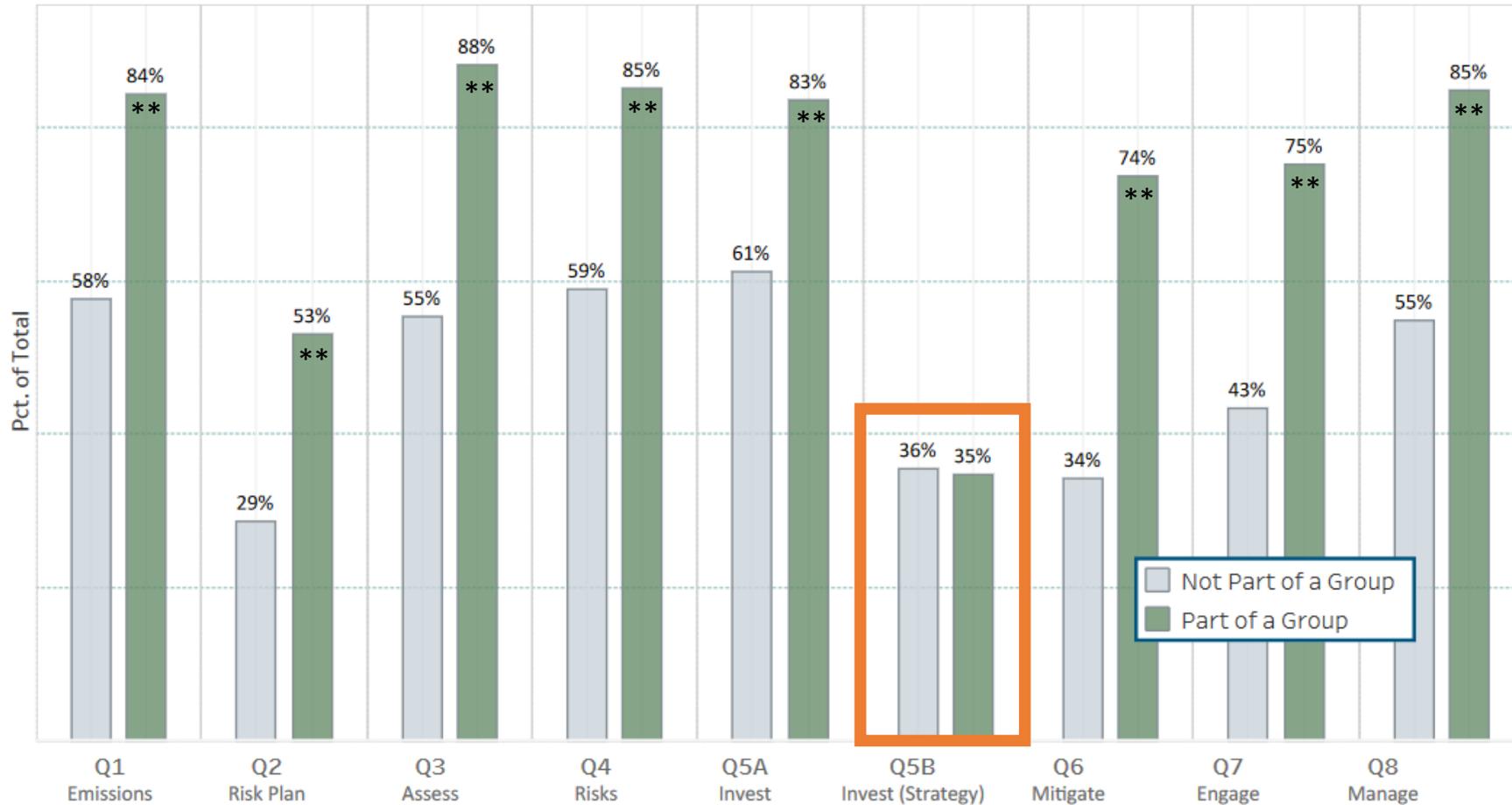
Insurer part of a group (n = 924 or 74%) and Insurer not part of a group (n = 321 or 26%)

** P < .01; * P < .05

Unique responses vs. groups

Only one question had uniformly low responses:
5B: Has the company altered its investment strategy in response to climate change considerations?

Is there a difference between companies that are part of a group and not part of a group?

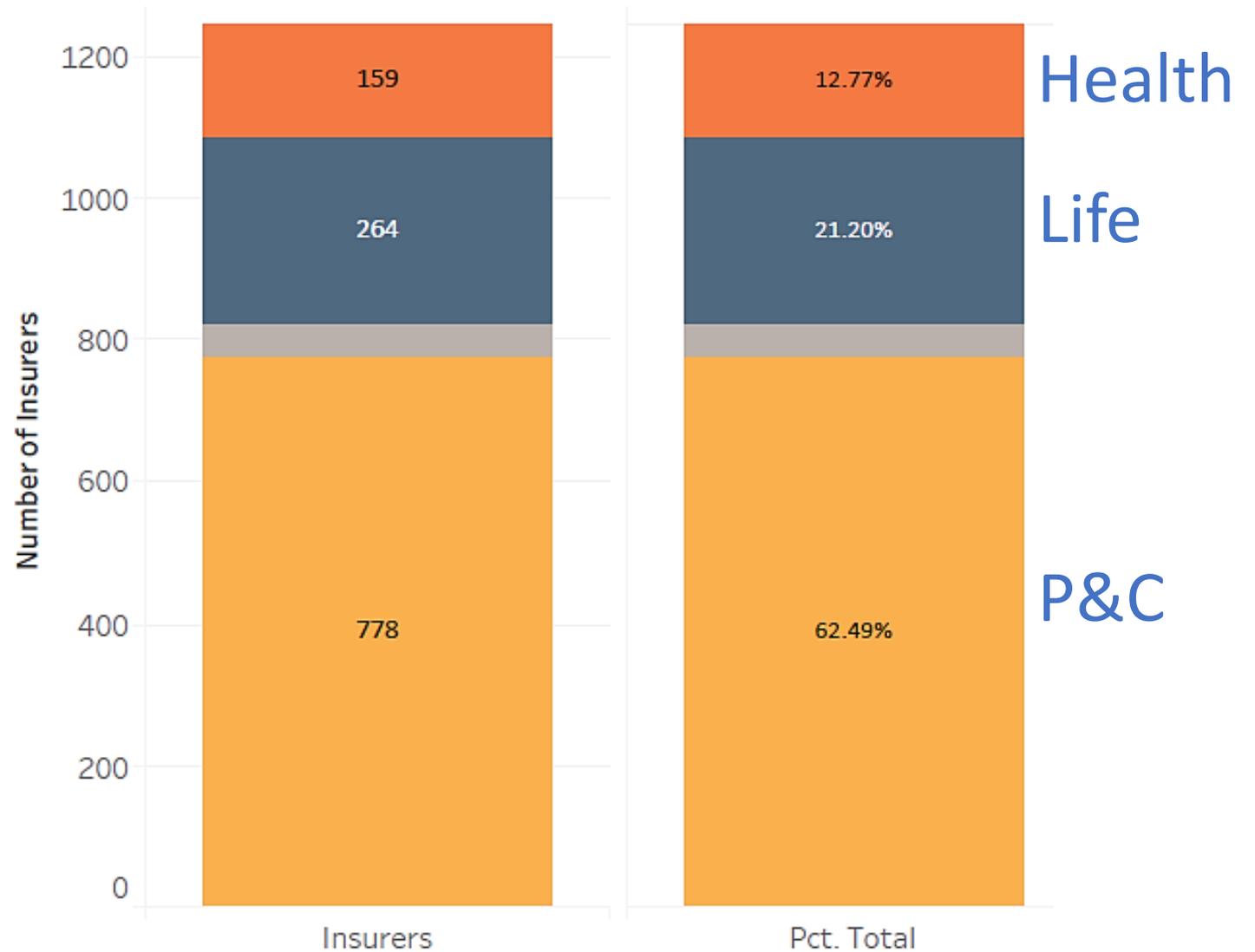


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Line of business

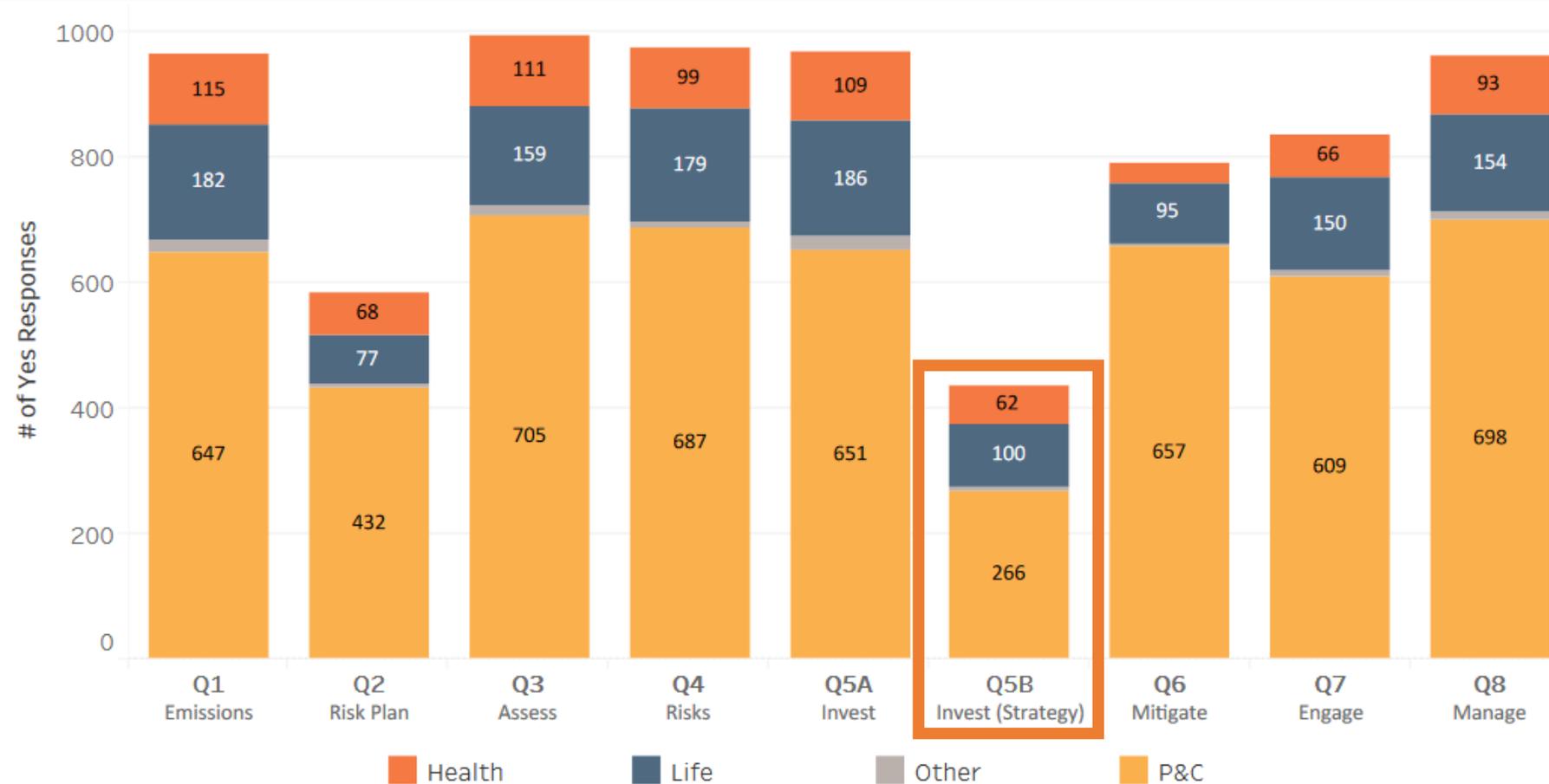
- P&C: The majority of total responses (63%)
 - Large entities made up of many smaller companies
- Life: 21%
- Health: 13%
- “Other” included 44 companies (title, crop and earthquake)
 - Dropped from most analyses



Line of business

- Property & casualty insurers make up the largest number of companies & largest number of yes responses
- One big difference: Life & health relatively **higher** on question about change in investment strategy

Question Summary
Number of Yes Responses By Line Of Business



Number of Insurers (Health: n = 159, Life: n = 264, Other: n = 44, P&C: n = 778)

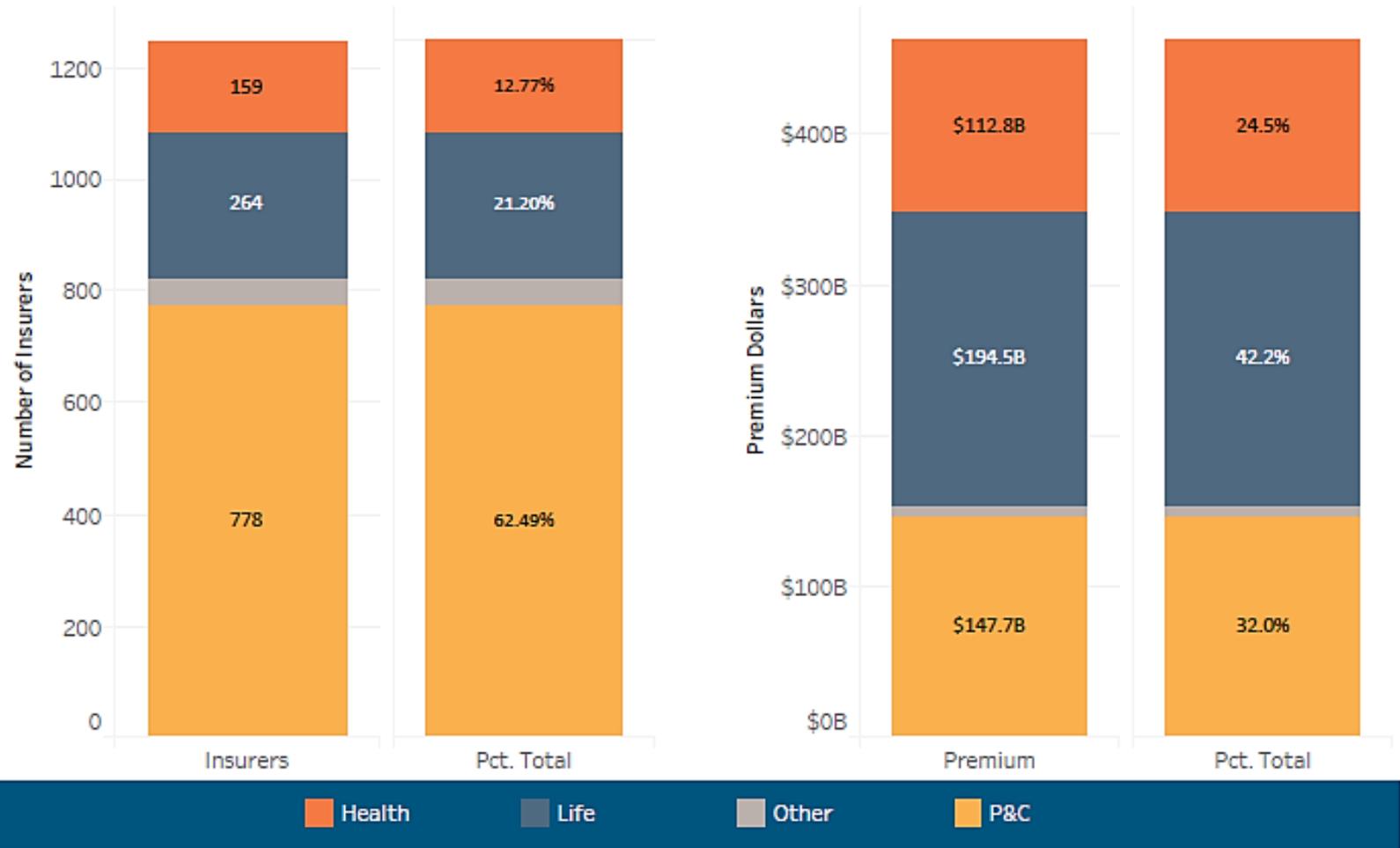
Entity Metric: Individual Insurer

Line of business & premium

Premium data from NAIC's Schedule T

- P&C is largest number of companies, but **life** makes up largest percentage in premium dollars.
- **Health** makes up nearly a quarter of insurers.

Comparison of Insurer Counts to Premiums Dollars By Line of Business
1245 Total Respondents / Premium Source for Six Survey States: Schedule T



Responses over time

A 2016 Ceres analysis looked at largest companies' climate survey data by 5 core themes

- 1: Climate governance
- 2: Enterprise-wide climate risk management
- 3: Climate change modeling & analytics
- 4: Stakeholder engagement
- 5: Internal greenhouse gas management

This set of charts: Current form of survey (since 2012) to 2018



Photo by Malvestida Magazine on Unsplash



Ceres themes & NAIC questions

1: **Climate governance**

NAIC Q2: Policy re: risk management

2: **Enterprise-wide climate risk management**

NAIC Q3: Process for identifying risks

NAIC Q4: Risks posed by climate change

NAIC Q5: Investment strategy

3: **Climate change modeling & analytics**

NAIC Q8: Action to manage risks

4: **Stakeholder engagement**

NAIC Q6: Policyholders—reduce loss

NAIC Q7: Engage constituencies

5: **Internal greenhouse gas management**

NAIC Q1: Plan to assess emissions

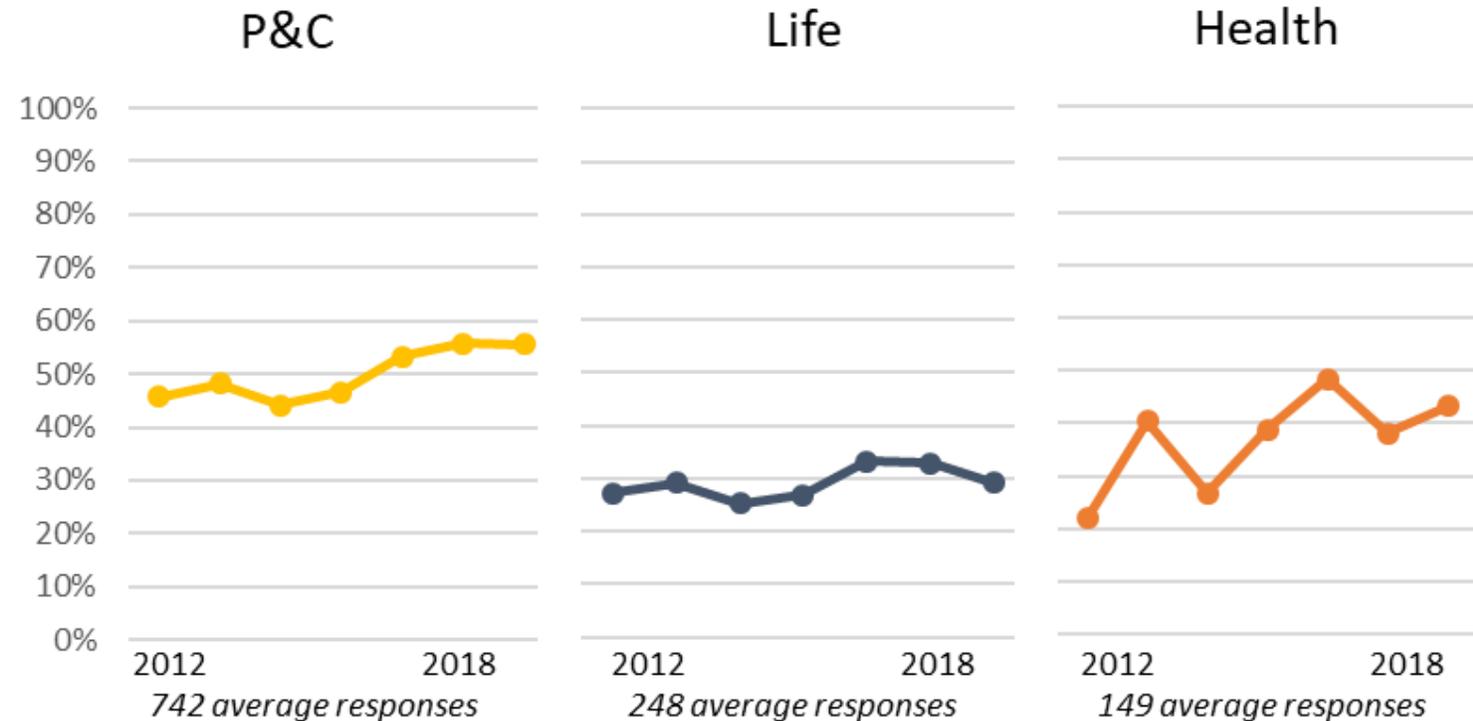
Photo by [Malvestida Magazine](#) on [Unsplash](#)

Responses over time: Climate governance

- P&C companies **more likely** to have a policy related to risk management & investment management
- Health is **uneven but growing**

Question 2: Risk plan

Does the company have a climate change policy with respect to risk management and investment management? Companies answering yes by line of business, 2012-2018



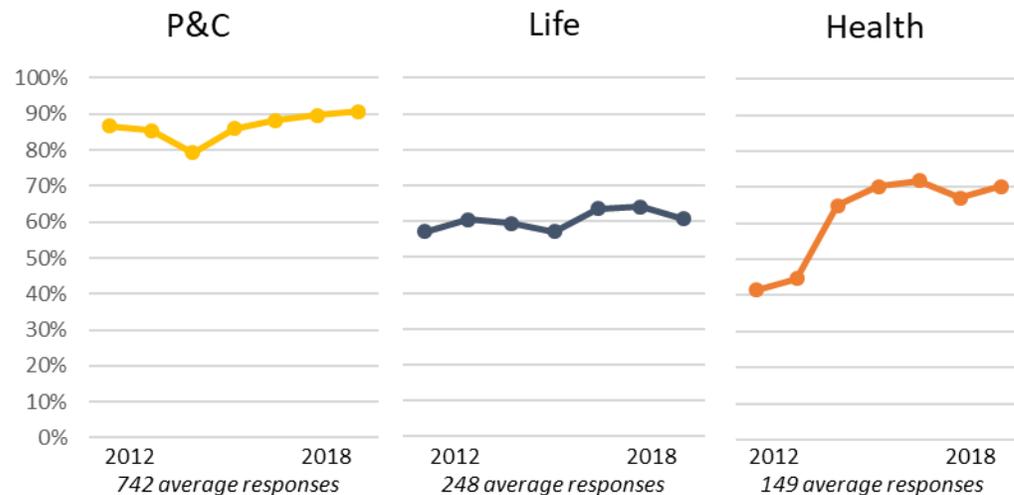
Over time: Enterprise-wide climate risk management

- P&C companies seem more likely to **recognize climate risks to business**
- More than half of all companies currently report **some engagement**

Question 3: Assess

Describe your company's process for identifying climate change-related risks and assessing the degree that they could affect your business, including financial implications.

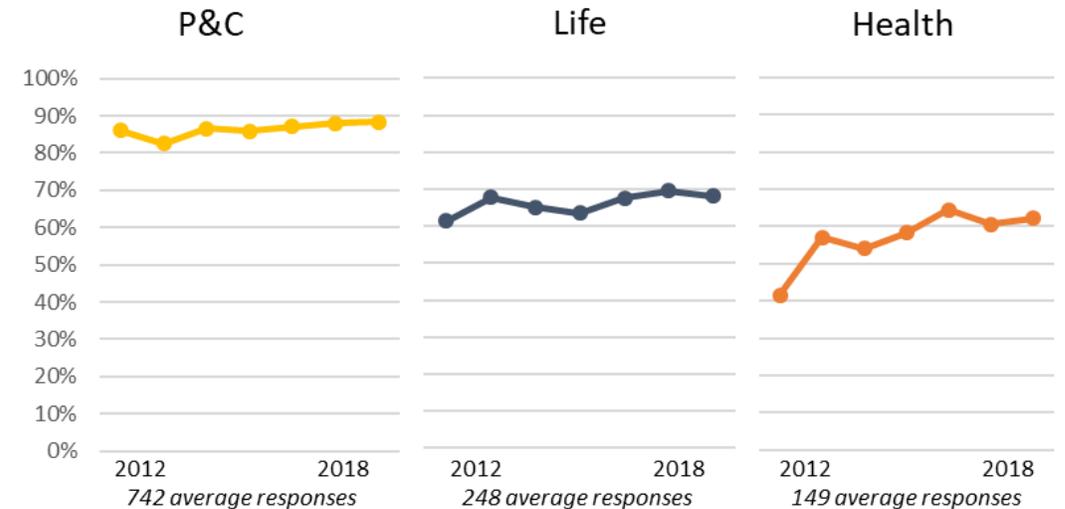
Companies answering yes by line of business, 2012-2018



Question 4: Risks

Summarize the current or anticipated risks that climate change poses to your company.

Companies answering yes by line of business, 2012-2018



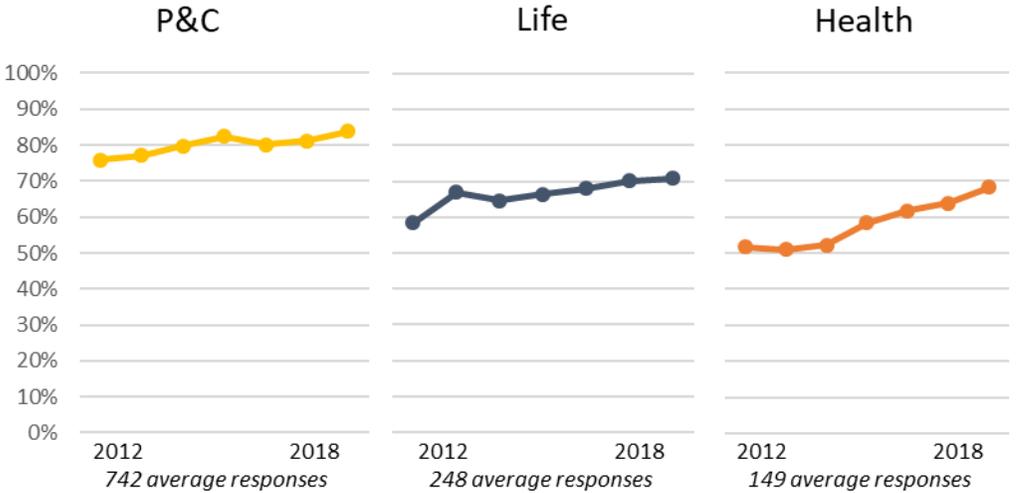
Over time: Enterprise-wide climate risk management

- Investment questions
- Companies may have answered “no” to investment strategy question if **changes were previously made** (time frame not specified)

Question 5a: Invest

Has the company considered the impact of climate change on its investment portfolio?

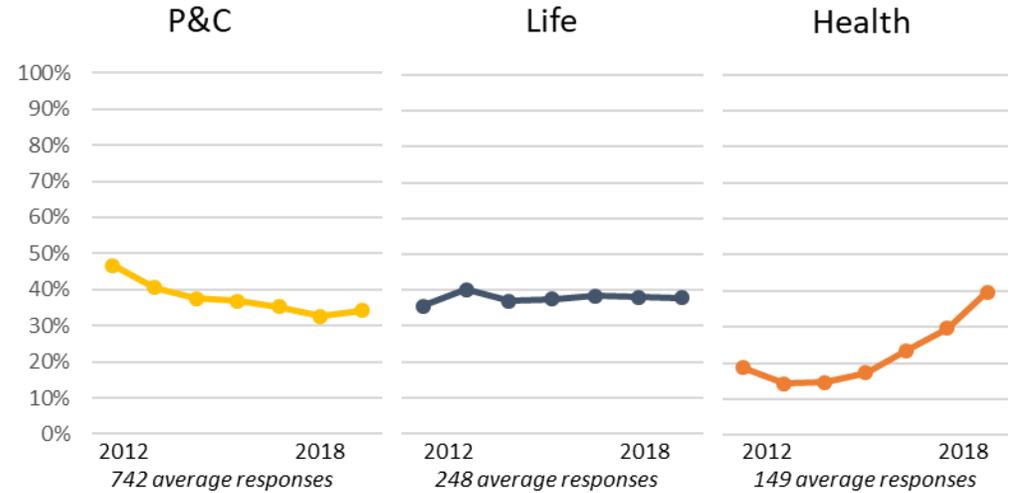
Companies answering yes by line of business, 2012-2018



Question 5b: Invest (Strategy)

Has it altered its investment strategy in response to these considerations? Companies

answering yes by line of business, 2012-2018

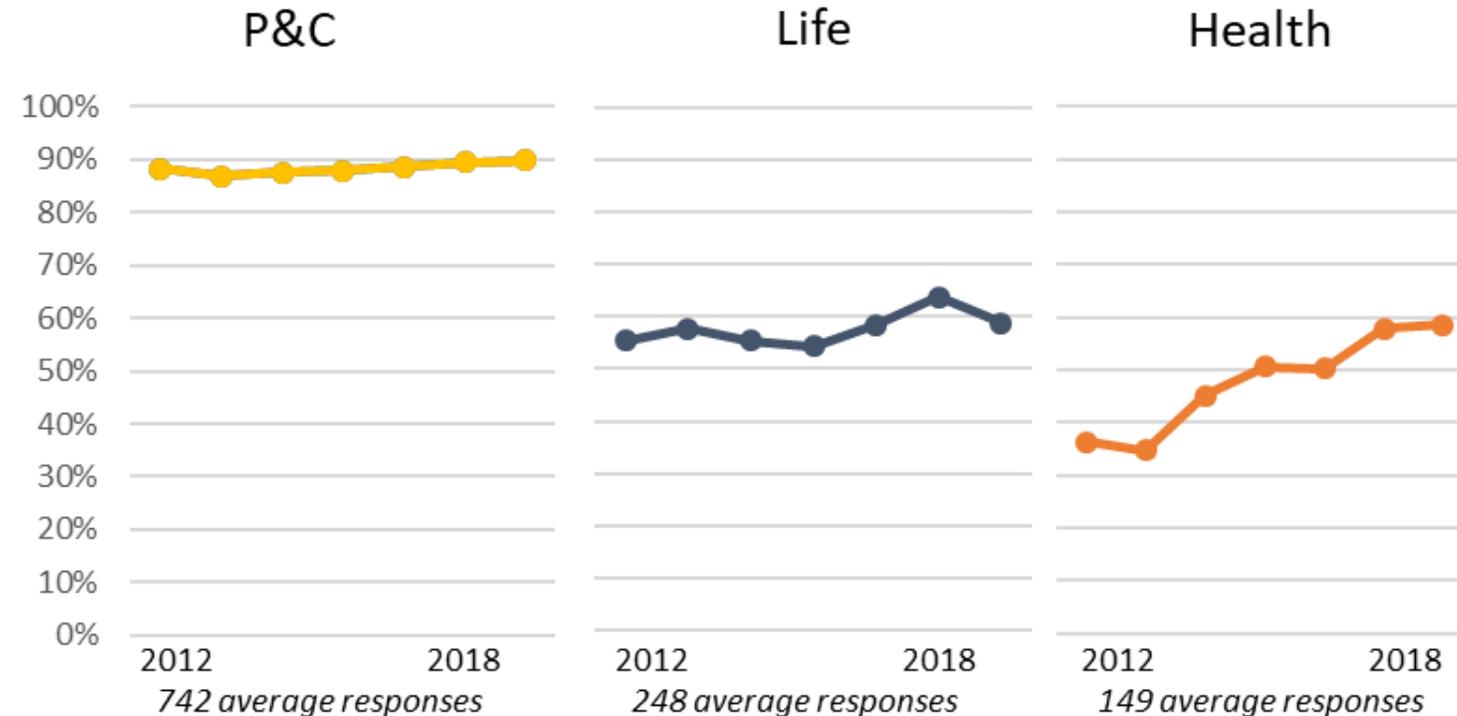


Over time: Climate change modeling & analytics

- Not surprisingly, P&C is most engaged in climate-related modeling & analytics since its underwriting is **most affected** by increases in extreme weather events
- **Increase in health** engagement from ~30% to nearly 60%

Question 8: Manage

Describe actions the company is taking to manage the risks climate change poses to your business including, in general terms, the use of computer modeling. Companies answering yes by line of business, 2012-2018

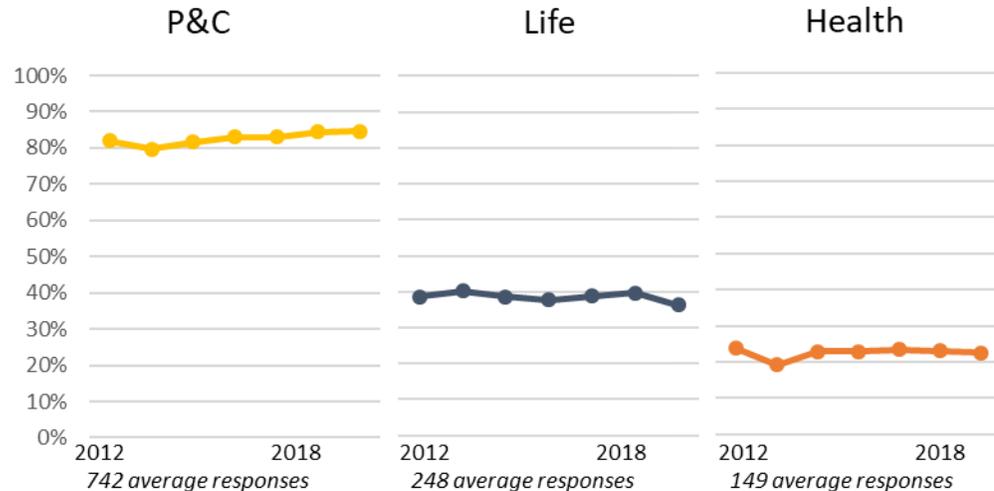


Over time: Stakeholder engagement

- Makes sense for P&C companies to encourage policyholders and other stakeholders to **mitigate climate impacts**
- Low health engagement suggests **opportunity exists** to educate health insurers about climate change impacts on policyholder health

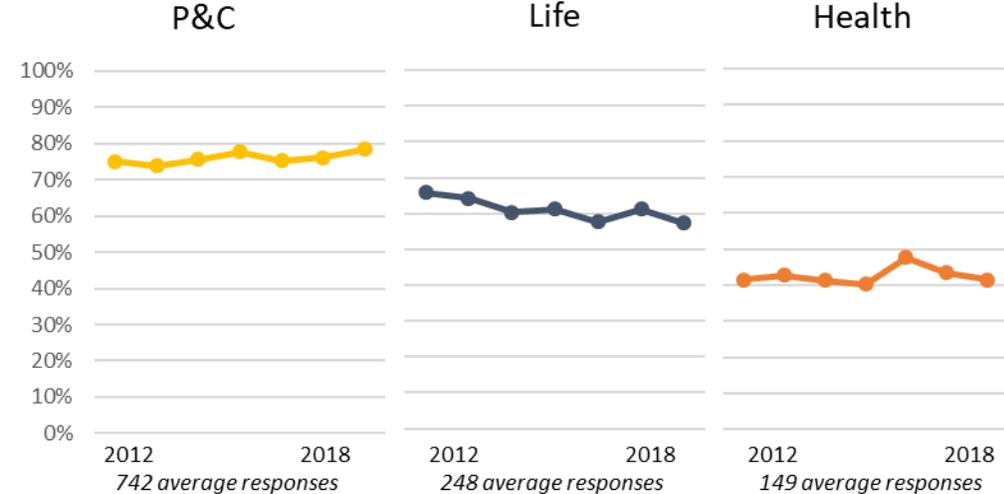
Question 6: Mitigate

Summarize steps the company has taken to encourage policyholders to reduce the losses caused by climate change-influenced events. Companies answering yes by line of business, 2012-2018



Question 7: Engage

Discuss steps the company has taken to engage key constituencies on the topic of climate change. Companies answering yes by line of business, 2012-2018

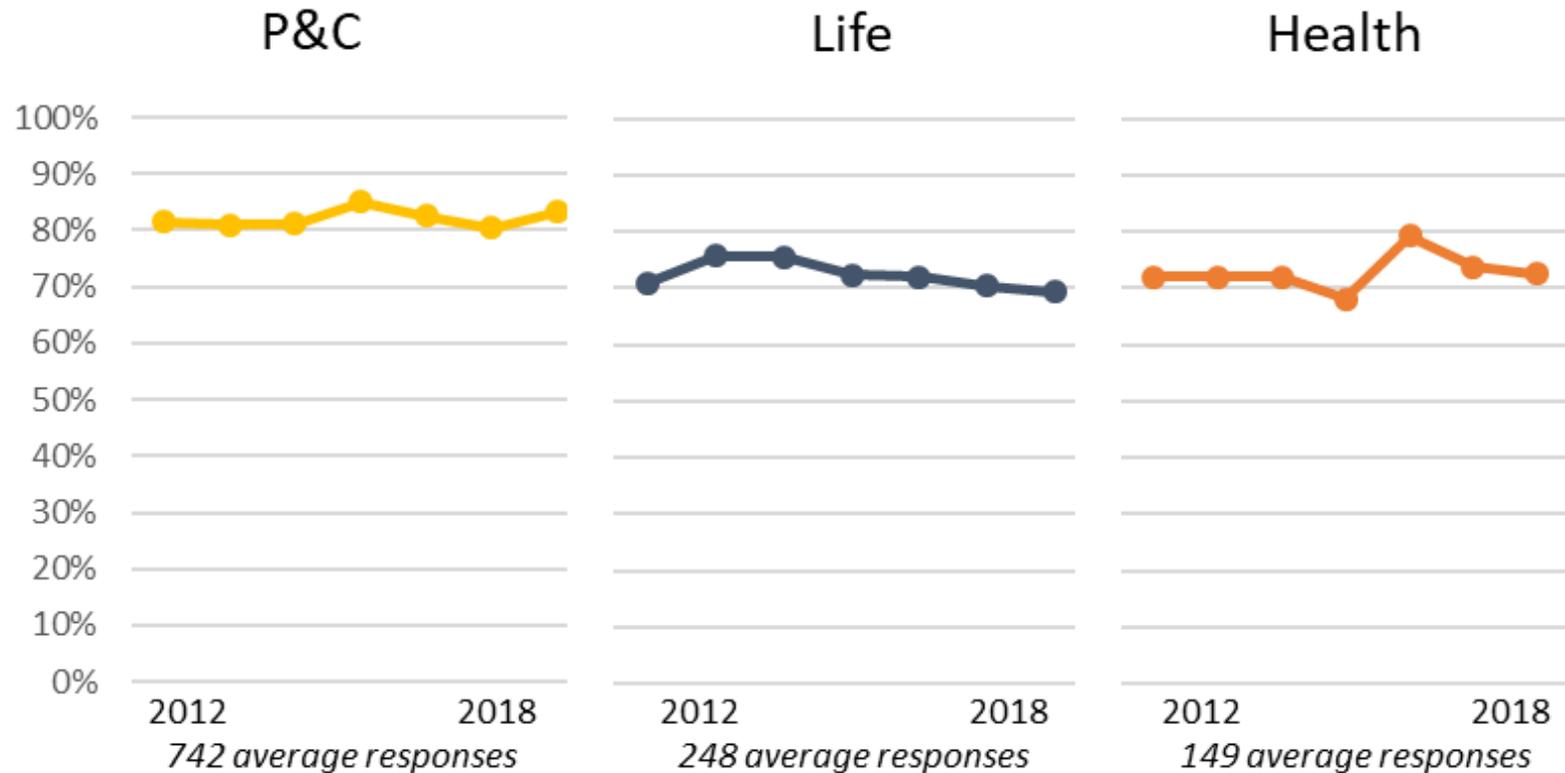


Over time: Internal greenhouse gas management

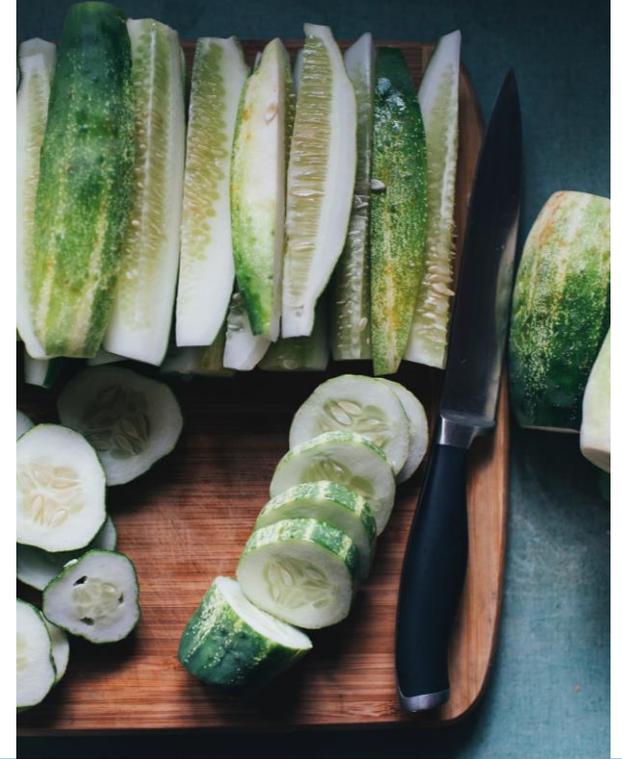
- Responses are similar across lines of business
- Companies share **similar operational challenges & opportunities**
 - Energy-efficient buildings
 - Encouraging telecommuting
 - Electronic document delivery

Question 1: Emissions

Does the company have a plan to assess, reduce or mitigate its emissions in its operations or organizations? Companies answering yes by line of business, 2012-2018



- P&C companies make up a large number of companies, but life represents most premium
- P&C seems most broadly engaged with climate risk activities
- Except– climate has larger impact on investment strategy among life & health companies
- Over time, health engagement has been uneven but trending upward
- Companies are equally likely to take internal action



Key takeaways: Yes/No questions

2019

Responses were due Aug. 31, 2020

- For the first time, this includes option to submit TCFD in lieu of NAIC survey
 - 73 TCFD responses submitted by 7 groups and handful of individual companies
 - 1,096 companies filed traditional survey
 - TCFD is a different format and different questions





The numbers provide information but not context

500,000 words of qualitative responses contain a lot of additional meaning but is a lot to parse

What does it all mean?



Photo by [Dollar Gill](#) on [Unsplash](#)

Let the computer figure it out: Natural Language Processing (NLP)

Text mining can broadly identify common themes

Survey Words



Question 6: *Steps the company has taken to encourage policyholders to reduce losses caused by climate change-influenced events*

Premium Info

INSURER	CA_PREM	CT_PREM	MN_PREM	NM_PREM	NY_PREM	WA_PREM
10014	106991041	4962760	11931366	2946771	70114903	41305018
10030	68566763	8284150	6158357	1994456	52767591	9472571
10050	0	0	0	0	0	0
10051	0	77819	311758	2188737	0	8084890

Required to File

INSURER	CA_REQ	CT_REQ	MN_REQ	NM_REQ	NY_REQ	WA_REQ
10014	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
10030	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
10050	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
10051	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE

Weather Perils

INSURER	FIRE	FLOOD	ICE	HAIL	HURRICANE	WIND
10014	FALSE	TRUE	FALSE	TRUE	TRUE	FALSE
10030	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE
10050	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
10051	TRUE	FALSE	FALSE	FALSE	TRUE	TRUE

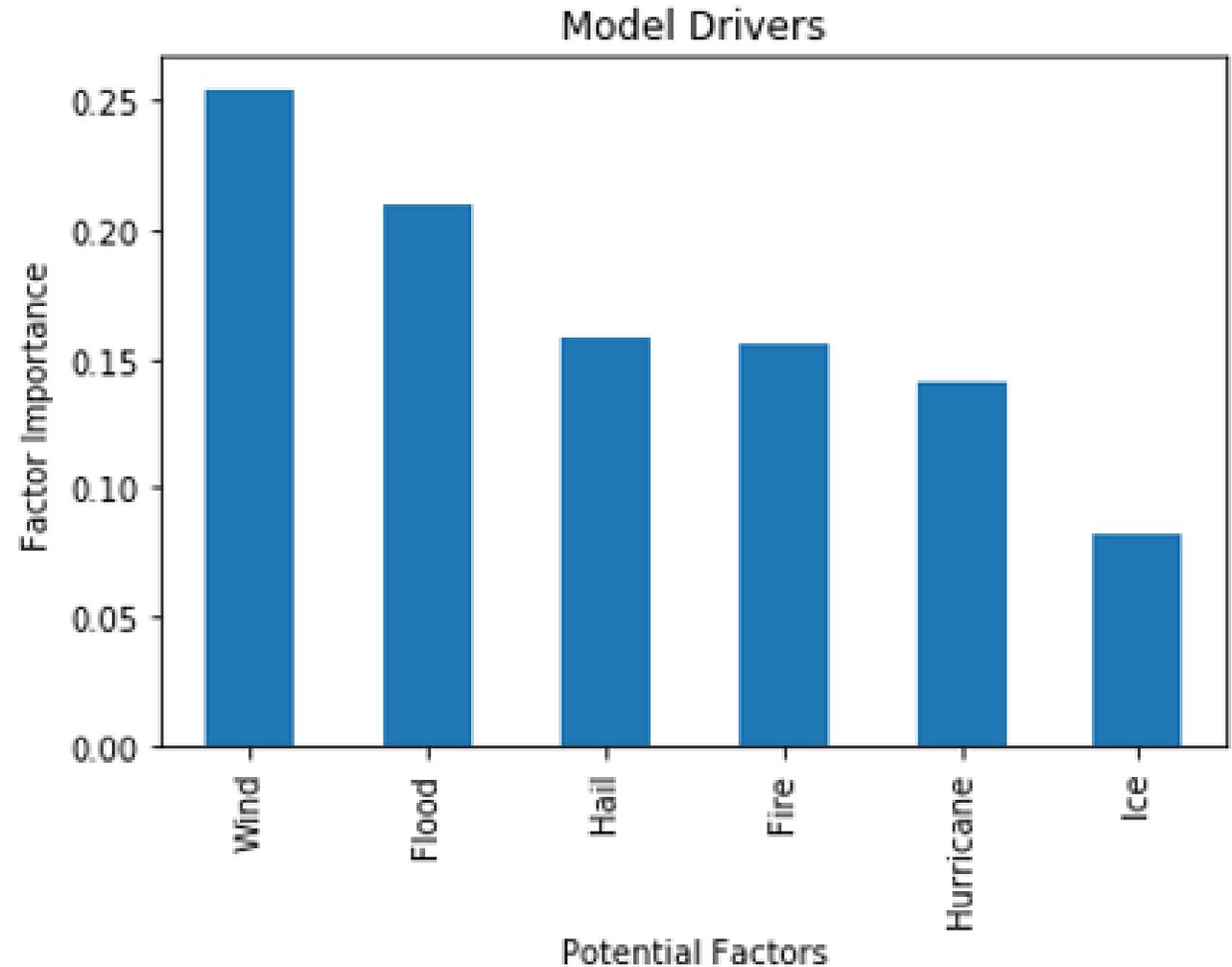
Target

DISCOUNT
TRUE
FALSE
FALSE
TRUE

Most Accurate Feature Set: Weather Perils

- NLP can identify common themes/ groups of words
- Not yet able to interpret meaning but can suggest themes to pursue

Supervised Learning	Overall Accuracy	False Prec.	True Prec.
Decision Tree	0.84	0.94	0.70
Naïve Bayes	0.72	0.71	0.81





- AI holds potential, especially **when machines “learn”** by studying human analysis
- Currently, **humans** can more easily & meaningfully identify themes and interpret open-ended results than computers

QUALITATIVE ANALYSIS

The Process: What is qualitative analysis?



One response to one question: How do we make sense of this?

Question 6: Summarize steps the company has taken to encourage policyholders to reduce the losses caused by climate change-influenced events. Response from American Standard Insurance Company of WI, 2018

American Family encourages policyholders to prevent or mitigate losses caused by covered perils, whether or not the losses can be attributed to climate change. This includes providing customers with informational newsletters and brochures related to loss reduction. For example, we provide brochures that outline how to reduce wildfire risk. We also offer discounts in many states for customers that have impact-resistant roof materials and a discount for customers who utilize connected home. Loss control services are available for commercial and farm/ranch accounts. Flood coverage is available through our agents via the National Flood Insurance Program.

Furthermore, American Family is a member of the Insurance Institute for Business and Home Safety (IBHS). The following text, prepared by IBHS, is a brief description of the Institute and some of its activities that relate to the issue of climate change.

IBHS is a 501(c)(3) organization, wholly supported by the property (re)insurance industry, which conducts objective, scientific research to identify and promote effective actions that strengthen homes, businesses and communities against natural disasters and other causes of loss. IBHS does this by identifying and advocating improved property design, construction, retrofitting, maintenance, repair and preparation practices. IBHS guidance for mitigating property losses is available directly to the public and to our members/policyholders, at www.disastersafety.org, and through social media (e.g., Facebook, Twitter, LinkedIn, YouTube and Vimeo).

IBHS advocates the concept of “going green and building strong” recognizing that addressing climate change involves reducing greenhouse gas emissions and adapting homes, businesses, and communities to severe weather that may result from climate change:

- As an insurance-supported organization, IBHS recognizes that climate change strategies must do more than build structures to be energy efficient. They must be built to modern fire protection standards to help resist fire and avoid the water/chemical deluge needed for fire suppression; they should be strong enough to avoid wind destruction and resulting relocation in landfills; and properties should be sited and elevated in a manner that protects against flooding and environmental degradation from landslides. All of these are part of “going green.”
- IBHS also firmly believes that adaptation is critical, not only to reduce long-term property insurance losses, but to buttress individual and societal resilience. All of the property protection measures that IBHS advocates to strengthen structures against current weather threats will also reduce future losses caused by climate change events. And, the unprecedented scientific research conducted at the unique IBHS Research Center is critical to identification of new mitigation actions that may help protect against more severe weather events.
- Additionally, research conducted by IBHS will help to make sure that “green” building enhancements do not inadvertently cause structures to be less disaster-resistant, or even worse, threaten the life safety of occupants or first responders—for example, photovoltaic arrays that take flight or pose fire suppression challenges are the antithesis of “building strong.”

In 2014, American Family Insurance partnered with IBHS through a first-of-its-kind national study that will support IBHS researchers over the next 25 years in identifying the effects of aging on residential roofing materials, with the ultimate goal of making residential roofs last longer and leak less ultimately helping customers mitigate risks. The study will determine how Midwest weather affects different brands of roofing material, using a dozen scientifically instrumented roof structures built on a bare patch of ground at American Family’s corporate headquarters. This is a part of a larger study driven by IBHS and other participating member companies.

In 2015, American Family partnered with Nest Labs to offer Nest products to insured homeowners in an effort to reduce losses related to fire, water damage and exposure to carbon monoxide poisoning.

Start by highlighting key points

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In 2015, American Family partnered with Nest Labs to offer Nest products to insured homeowners in an effort to reduce losses related to fire, water damage and exposure to carbon monoxide poisoning.

Key points suggest common themes

Question 6: **Summarize steps the company has taken to encourage policyholders to reduce the losses caused by climate change-influenced events.** Response from American Standard Insurance Company of WI, 2018

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 - IBHS also firmly believes that adaptation is critical, not only to reduce long-term property insurance costs, but also to ensure that measures that IBHS advocates to strengthen structures against current weather threats will also be effective. Research conducted at the unique IBHS Research Center is critical to identification of new mitigation strategies.
 - Additionally, research conducted by IBHS will help to make sure that “green” building enhancements do not threaten the life safety of occupants or first responders—for example, photovoltaic arrays that generate electricity while providing shade.
- In 2014, American Family Insurance partnered with IBHS through a first-of-its-kind national study on residential roofing materials, with the ultimate goal of making residential roofs last longer and more resilient. The study examined how Midwest weather affects different brands of roofing material, using a dozen scientifically instrumented test homes in American Family's headquarters. This is a part of a larger study driven by IBHS and other participating member companies.
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← Outreach-- To policyholders-- Disseminate key information

← Outreach-- Memberships, partnerships

← Outreach-- Research

← Outreach-- Memberships, partnerships

Code key points into analysis software

Codes

Name	Files	Referen
Strategies within company	1	1
Risks posed by CC	0	0
Outreach	1	2
With partners, external	1	2
Work with environm	1	3
Research	1	4
Memberships, partn	1	32
Influence regulation	1	4
To policyholders	1	22
Social media, direct	1	17
Help identify, mitiga	1	29
Disseminate key inf	1	39
Advertise social res	1	1
Line of business	0	0

Disseminate key information
 Help identify, mitigate risk
 Q6 Climate survey 2018 (2)

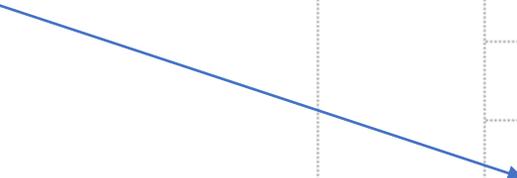
ID	Year	N...	Compa...	Line Of	Question 6
8	2018	192 83	America n Standar d Insuranc e Compan y of WI	Property & Casualty	Y e s	<p>American Family encourages policyholders to prevent or mitigate losses caused by covered perils, whether or not the losses can be attributed to climate change. This includes providing customers with informational newsletters and brochures related to loss reduction. For example, we provide brochures that outline how to reduce wildfire risk. We also offer discounts in many states for customers that have impact-resistant roof materials and a discount for customers who utilize connected home. Loss control services are available for commercial and farm/ranch accounts. Flood coverage is available through our agents via the National Flood Insurance Program.</p> <p>Futhermore, American Family is a member of the Insurance Institute for Business and Home Safety (IBHS). The following text, prepared by IBHS, is a brief description of the Institute and some of its activities that relate to the issue of climate change. IBHS is a 501(c)(3) organization, wholly supported by the property (re)insurance industry, which conducts objective, scientific</p>

Outreach-- To policyholders-- Disseminate key information

Collect data points from multiple responses into common themes

Codes		Search Project		
	Name	Files	Referen	
+ <input type="radio"/>	Strategies within company	1	1	
+ <input type="radio"/>	Risks posed by CC	0	0	
- <input type="radio"/>	Outreach	1	2	
- <input type="radio"/>	With partners, external	1	2	
	<input type="radio"/> Work with environm	1	3	
	<input type="radio"/> Research	1	4	
	<input type="radio"/> Memberships, partn	1	32	
	<input type="radio"/> Influence regulation	1	4	
- <input type="radio"/>	To policyholders	1	22	
	<input type="radio"/> Social media, direct	1	17	
	<input type="radio"/> Help identify, mitiga	1	29	
	<input type="radio"/> Disseminate key inf	1	39	
	<input type="radio"/> Advertise social res	1	1	
+ <input type="radio"/>	Line of business	0	0	

Outreach-- To policyholders--
Disseminate key information



Collate common data points for further examination

Disseminate key information Help identify, mitigate risk Q6 Climate survey 2018 (2)

[<Files\\Q6 Climate survey 2018 \(2\)>](#) - § 39 references coded [0.92% Coverage]

Reference 1 - 0.01% Coverage

We regularly advise our clients on how to ensure that well-meaning energy saving products do not adversely contribute to a fire or make the facility more vulnerable to natural catastrophe losses. We advise them on how to quickly recover from losses that do occur, which includes preplanned and engineered environmental remediation strategies

Reference 2 - 0.05% Coverage

Given the company's geographic footprint and changing weather patterns, it takes a proactive stance on providing consumer education that helps its policyholders - and other consumers - prepare for and weather severe storms, wildfires and other potentially disastrous events. A wide range of consumer tools are available to agents and policyholders to support planning and preparedness.

Reference 3 - 0.01% Coverage

Provide customers access to safety and disaster preparedness materials via participation and sponsorship of International Business and Home Safety and connection to materials via Loss Control Portal.

Reference 4 - 0.08% Coverage

To encourage agents and policyholders to reduce losses caused by climate change influenced events, Frankenmuth Insurance educates its agents and policyholders by means of publications including agency bulletins, which address loss control, safety, and other related topics.

Reference 5 - 0.02% Coverage

We educate the public about flooding, wildfires and tornadoes through financial representative columns, which are often published in

Multiple checks & balances to account for subjectivity

- Several members of research team read independently & agree on themes together
- Multiple coders
- Transparent—data is publicly available for review



Isn't qualitative analysis subjective?



Broad themes

- Risks
- Geographic areas
- Line of business
- Change in investment strategy
- Change in business practices
- Strategies within company
- Outreach



Broad themes

- Risks
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Strategies within company

Climate change policies

- Adopt Environmental, Social and Governance (ESG) guidelines
- Sign Principles for Responsible Investment (PRI)
- Establish climate working group/ advisory board
- Implement TCFD
- Participate in California Climate Risk Carbon Initiative

Behavior: sustainability initiatives

- Access to transport/ reduce commuting among staff
- Reduce employee travel
- Recycle
- Paperless communication

Buildings: infrastructure upgrades

- Energy efficiency at buildings (e.g., LEED)

Internal task force, committee

Use of catastrophe modeling

- Qualitative analysis is ongoing: more insights emerging
- Identified themes could provide basis for multiple choice answers
- TCFD reports from companies outside insurance could provide examples of best practices from high performers in other industries

Conclusions and notes

Challenge/ opportunity

- Filing NAIC climate risk disclosure survey requires huge investments of time & resources from companies who answer thoughtfully
- Valuable information is being lost because stakeholders can't easily interpret the survey data

Asset manager from major investment company: **“If you could make the survey easier to parse, it could inform policy”** and help investors identify green companies

Another stakeholder said the survey could provide **information about knowledge deficits that could be remedied** through better education

Survey improvement

- Our analysis suggests options for fine-tuning the survey:
 - Specify time frame (e.g., changes within the past 1-2 years)
 - Clarify questions
 - Ask questions specific to lines of business?
- Not necessary to start from scratch
 - Retain existing questions and add multiple-choice subquestions
 - Closed-ended questions easier to analyze and compare
 - Open-ended questions could be reserved for unique insights
 - Overall, survey would be easier to complete
 - Would still be possible to compare results across years

What's the goal?

- Provide insurance companies benchmarks for comparison against other companies?
- Help investors identify companies best positioned to confront climate risks?
- Give consumers a way to choose companies that align with their values?

Risk disclosure survey questions should be tailored to elicit desired information

Onward

- Climate risk disclosures are vital to the insurance industry
- NAIC is uniquely positioned to elicit useful disclosures
- NAIC's **renewed & strengthened** commitment to climate risk is a unique opportunity to move the needle on climate resilience



**National Association of
Insurance Commissioners**

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for **INSURANCE**
POLICY
and **RESEARCH**

Thank you!

- NAIC Climate Working Group and Climate and Resiliency (EX) Task Force
- CIPR team, especially Paula Harms, Miranda Dahman, Juan Zhang and Jeff Czajkowski
- Steven Jackson, Assistant Director for Research, American Academy of Actuaries
- Jay Bruns, Senior Climate Policy Advisor, Washington State

Questions?

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