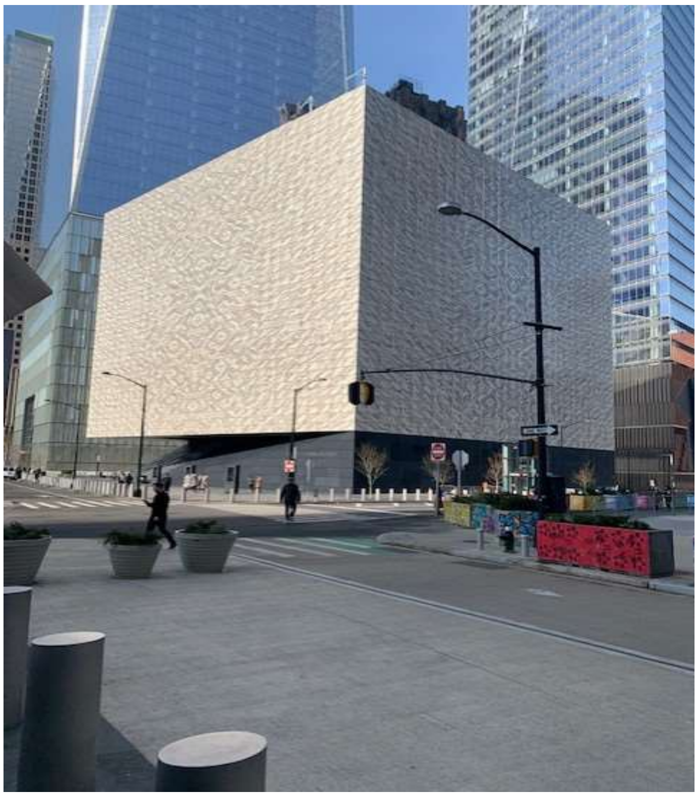
Actuarial Risk Management
Global Actuarial Consultancy

Crossing Thin Ice
2Q2024 Issue 10

Contents



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To Our Subscribers

We want to thank our new subscribers and welcome everyone to the tenth issue of the ARM Crossing Thin Ice newsletter! We hope that you find this publication valuable. With a few short articles meant to provide unique and valuable insights, we present ideas about how to address specific issues related to ERM and introduce potential risks and opportunities that may not yet be on your radar.

The primary authors are Dave Ingram and Max Rudolph. We have been active participants in the risk management, actuarial, investment and insurance spaces for many years.

Subscribers are encouraged to suggest topics for articles and ask questions of the authors during our follow-up webinars and podcasts. Ever cognizant of regulatory requirements and leveraging them to add value in practical ways is our focus.

Sponsored by **Actuarial Risk Management (ARM),** Crossing Thin Ice is free to all readers and in all forms.

A free webcast and podcast with the same name are also available. If you would like to further engage the authors as consultants, for continuing education purposes or to join our Risk Management Discussion Group, please reach out. More info can be found throughout this newsletter. We hope to help you find a solution that meets your needs!

Please forward to others who study risk.
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The content of this newsletter is meant to be educational and thought provoking.

Nothing in it should be interpreted as investment advice.

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Overconfidence

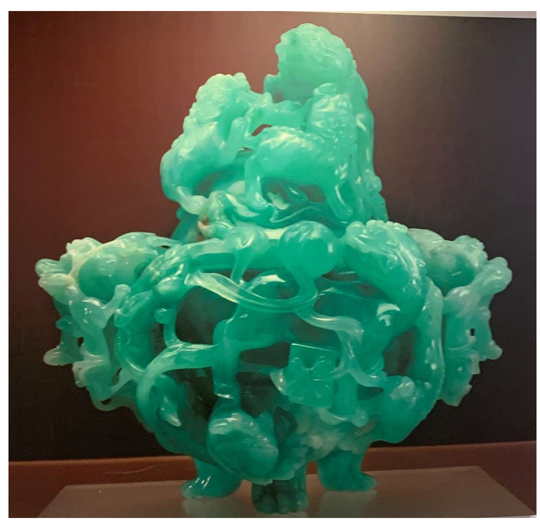
I am really sure that this will be an interesting article, but then, I have always been an Overconfident Writer. In the case of writing, I think that you need to be somewhat Overconfident, or else you would never put words on a page.

There are many realms like writing where overconfidence might be needed to get you off of square one, like public speaking, a new fitness routine or a diet. But there is a lot of danger in overconfidence when you are a senior executive of an insurer. Insurance, where premiums are collected ahead of claims, is a business where overconfidence often occurs and ends up resulting in frequent problems. An overconfident insurance manager might underprice their policies, embark on investment strategies that are much riskier than assumed, fail to adapt to changes in the environment along with a host of additional optimisms. One of the primary jobs of the Chief Risk Officer is to look out for overconfidence and to figure out a way to protect the company from the consequences.

But Overconfidence can also afflict the CRO. The job of CRO in an insurer requires an incredibly wide range of skills and experiences, including quantitative analysis, strategic thinking, communications, leadership, influencing and change management in addition to the specific knowledge of risk management, regulatory and rating agency requirements and comprehensive knowledge of every activity within the insurer. Someone who is successful at the CRO job probably needs the services of an ancient Roman "memento mori" who reminded the General celebrating a Triumph with a parade through Rome that they were still mortal.

The temptations of overconfidence for the CRO all boil down to the same thing - giving too much weight to their own opinions than to emerging real world experience. Examples include:

- Delayed recognition of Emerging Risks - Nassim Taleb gave the name "Black Swan" to the type of emerging risks that are not recognized in advance but have a high negative potential and are retroactively declared to have been predictable. Events like the 2008 Financial Crisis and the 2020 COVID pandemic fall into this category.



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Overconfidence (cont'd)

- Over Reliance on Complicated models - The output of complicated risk models are often presented as facts, as a way of developing the willingness to make decisions using those outputs. But in actuality, conclusions from these models fundamentally flow from decisions made by the modelers about the relationship between the past experience and the possible futures. If the CRO has been the final arbiter in decisions regarding model assumptions they are likely to be personally invested in those decisions and reluctant to make changes. They know that the model loses credibility with many audiences if the findings change too much or too frequently. So the CRO might overconfidently over-rely on the models.
- Disregarding Input from the Trenches - The executives of some insurers spend too much of their time talking with each other and not enough time talking to the people who are personally experiencing the business environment. Often new trends, both good and bad, are first felt at the fringe of the organization's reach, by sales people who are talking to customers and by customer service staff who are handling questions. But the CRO, who has no natural connections to either of those two sets of people in the trenches, may become overconfident with using the information that they receive via their risk reports.
- Overpromising on Risk Mitigations - When there is a new product at an insurer, a really good CRO will be at work during the product development phase, working with the product development team to identify any new mitigation programs that are needed. The CRO is likely aware that none of the existing risk mitigation programs are executed perfectly, but the temptation with a new mitigation is to initially evaluate it as if execution were perfect. In reality, sometimes mitigation actions are taken late, or they might not be the exact actions that were intended. Usually, effectiveness of mitigations is measured in terms of actual execution rather than ideal execution. But the CRO can behave overconfidently and assume that the mitigations that they design for the new product will happen exactly as planned.

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Overconfidence (cont'd)

To overcome these and other types of Overconfidence that the CRO may fall prey to, they need to do one or several of the following:

Stress Testing and Scenario Analysis - We recommend this on almost all occasions and this is one where it is particularly applicable. The CRO should be using these tests personally to assess what could be different if they are wrong about any of their positions about risks. This approach is particularly well suited for assessing the impact of Emerging Risks and of looking at alternatives to the complex model. What if we are wrong is the question that a Stress Scenario answers.

Diverse Inside Perspectives - If the CRO is in a larger organization, they will likely have a team of folks supporting them. To help the CRO deal with overconfidence, it is important that this team includes a couple of people who tend to have a different point of view and to encourage them to speak their mind. Linking this idea with Stress Testing, it would be a good idea to have some of the stress test scenarios represent those alternate viewpoints, which will make them a good test of Overconfidence. In a smaller company, the CRO will need to get these perspectives from interactions with other company leaders.

Outside Perspectives - As mentioned above, the CRO role does not include any natural links to company people at the edge of company activities. So to protect against overconfidence, the CRO needs to deliberately seek out outside perspectives by attending conferences, joining local, regional or national groups of executives where even casual conversations will provide a window on the world outside the company. Formal feedback from independent reviews of the risk management program can also offer the needed outside perspective.

It may seem ironic that the CRO, who is responsible to look out for overconfidence in the rest of the company, needs to look out for their own overconfidence, but if they are following some of the above suggestions or other ideas, they can be even more effective in helping to root out and overcome other's Overconfidence.

And lastly, the CRO needs to find their own 'memento mori' who brings them back down to earth. For me it has always been a brother who has never been even slightly impressed by me. It is important that I stay in touch with him. Too long apart and I start getting too impressed by myself.

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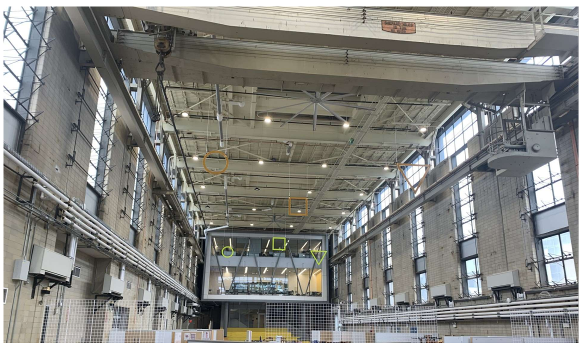
Is there a role for zero cash flow assets?

Whether a product of today's added complexity or a result of the recent reach for yield when rates are low, more assets are being held by insurance companies with irregular or deferred cash flows. Some find this a natural progression, while others never find it appropriate. The answer is somewhere in the middle. It depends, but often can add value when done in moderation. This article will walk us through examples that differentiate specific products between times of stability and stress.



Products and Methods

Let's look at two products. One is issued by a life insurer, a single premium deferred annuity (SPDA). One premium is received and earns interest based on the assets backing it in a segmented portfolio. The other is an auto insurance policy, issued by a property and casualty insurer, where a premium at the beginning of a period provides coverage for that period and is repriced each period. And a third situation will be assets that do not back a specific liability and are assigned to surplus.

For each of these three examples two scenarios will be presented. One will be a calm, stable, period where financial outcomes are strong. The second will be a stress scenario with high correlations between and within asset classes as market values drop.

Assets with no cash flows

Most asset cash flows are split between principal and income payments. As a simple example, you buy a bond, it pays interest periodically and the principal is repaid at maturity. There are a wide variety of options after that, with banks and shadow banks generating nearly any desired payment stream. Some assets, like non dividend paying equities, have no cash flows in perpetuity and bonds can build up principal rather than paying coupons.

SPDA

An SPDA is sensitive to interest rates. There is a guaranteed earned rate, so when rates fall the policy is more likely to persist. If rates are stable, or close to it, the block has a steady withdrawal rate. If rates rise quickly the policy holder can do better elsewhere so the insurer endures what resembles a run-on-the-bank.

Some insurers have invested in novel, illiquid asset classes like sports teams, venture capital or private equity. These have a wide range of structures and may rely on capital gains to provide future cash flows.

Assets are typically purchased to create cash flows, with some conservatism, that meet the time horizon of the liabilities. Some may need to be reinvested if income and principal arrive prior to the cash flow needs of the liabilities.

When markets are stable an SPDA is profitable, cash flows are manageable, and the assets are relatively liquid. While using all non-cash paying assets would make the block more fragile, the risk during these periods would be low.

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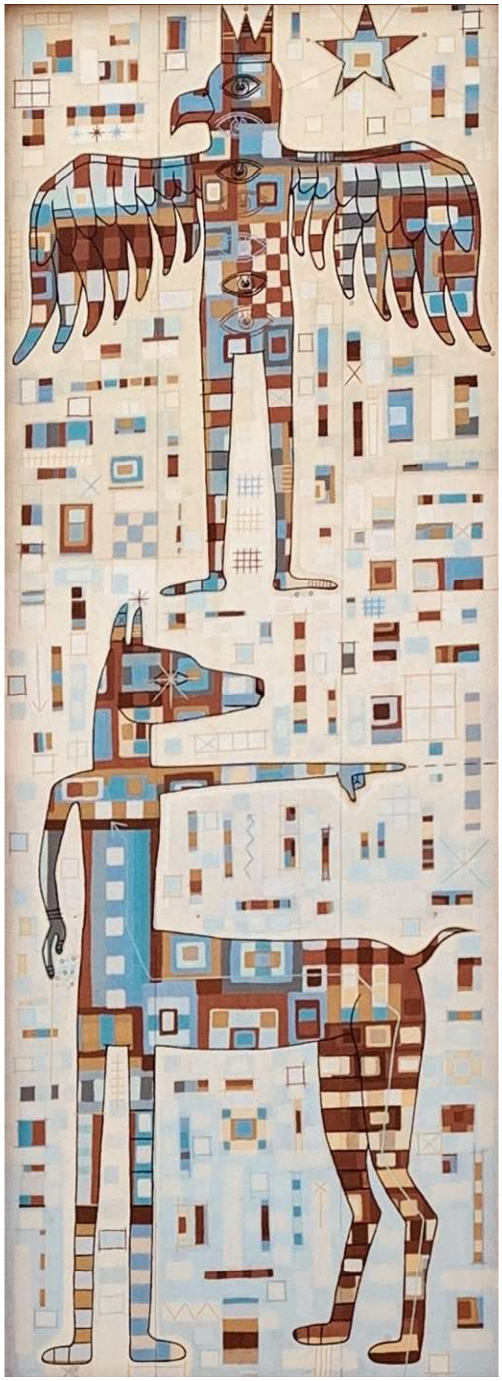
Is there a role for zero cash flow assets? (Cont'd)

But markets don't remain stable forever. If rates change materially, in either direction, what had been a reasonable ALM duration or cash flow match demonstrates its convexity risk and the mismatch grows. For the SPDA, if rates rise, more cash is needed to pay withdrawals and the assets are less valuable, even if they are liquid. For an insurer with a concentrated block in SPDA this can lead to insolvency, especially if there was already an ALM mismatch. So if rates fall, an insurer bleeds slowly, and if rates rise quickly the insurer either becomes insolvent or survives and moves forward.

Auto insurance

An auto policy has premiums that offset claims and expenses. This is referred to as float and can be invested in longer duration and less liquid assets since most policies are retained due to auto insurance being legally required.



A competitive market-place provides few advantages for the car owner to constantly shop a policy. Having a non-cash generating asset in the portfolio is reasonable during both stable and stressed times. Liquidity, however, remains essential if cash claims rise due to parts/labor inflation or social inflation since there is a lag before premiums can catch up.

Surplus assets

Assets in a surplus portfolio have less need for cash flows or conservatism, but still must be available during times of stress such as following a natural disaster, market implosion or pandemic. The insurer's own building, along with illiquid assets and asset classes inconsistent with product investment strategy, is often found in the surplus portfolio. There are few restrictions, but it should be remembered that a form of leverage called enterprise, or surplus, duration includes these assets so can be used to double down or offset effective duration mismatches created elsewhere. It generally is a good home for the insurer to add yield including some non-cash paying assets.

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Is there a role for zero cash flow assets? (Cont'd)

Balance with other risks

Risk management is all about balancing risk and return, and part of that is managing risks so strong correlations in stressful times don't overwhelm an asset portfolio. Interactions between interest rate risk, liquidity risk and credit risk should be balanced so a bad scenario doesn't push an insurer into insolvency. Stress testing can identify where these overlaps occur.

Other risks of concern deal with concentration and thinly traded markets.

In a liquid market you can sell an asset easily and at the market price without a haircut. But liquidity is typically needed most when risks have increased, buyers are few and correlations high. Short term liquidity, especially when everyone knows you have a problem independent of the market, can be costly.

Credit risk tends to have high correlations during market stress, and earned rates are higher for more risky fixed income instruments. Spread can also be earned by accepting risk tied to other variables, but these generally increase yield by less than 0.10%.

Conclusion

There is not a single one-size-fits-all investment strategy for an insurance company. Each is unique based on products and risk appetite. Some have expressed concern when assets with no recurring cash flows are included in an investment strategy. As we saw with SPDA this can be a problem but, as always, the situation is more nuanced than that.

Insurers typically have expertise in some areas and not in others. They may be very good at managing short-term liabilities, and prefer a conservative portfolio, or they may view home and auto liabilities as float, like a loan, and focus on their investment expertise. Others understand complex financial instruments or reinsurance transactions. A balance between all these interacting risks using narrative scenarios can, with some redundancy and conservatism, result in reduced risk overall.

Are you following the work Dave and Max are doing about scenarios and regime change?

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Scenario Planning in 10 Steps

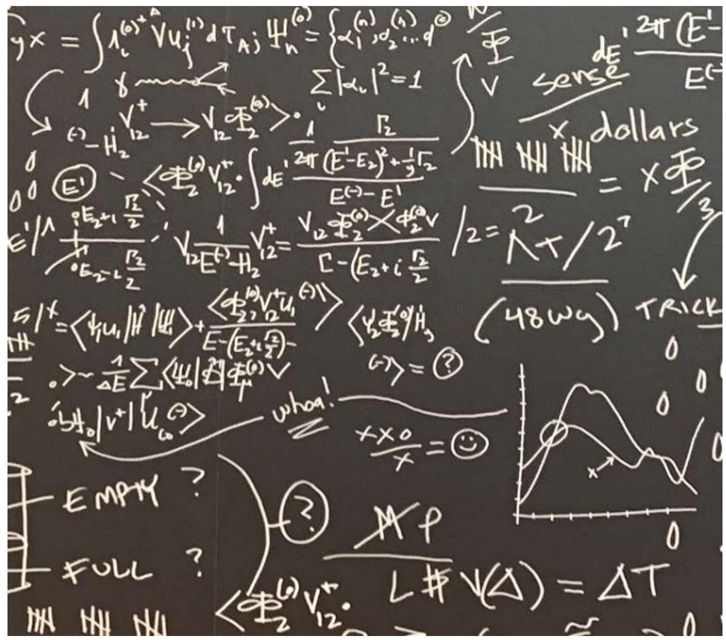
Many companies have used Scenario Planning as a major part of their strategic planning process, indeed Strategic Scenario Planning by Royal Dutch Shell was what first made the practice famous. We have talked a lot about Scenarios. Today we want to introduce you to a 10-step process for using Scenarios to inform your planning process.

Step 1 - Purpose and Scope of the Scenario Planning Exercise

Scenario Planning is used to do a deep dive into how company strategy might have to change in different future environments. But Scenario Planning can also be used with Risk Management to look at Emerging Risks, for crisis preparation and for any other forward-looking activities within a company. A Scenario Planning exercise can either be charged with identifying different arenas for their investigation or they may be convened with a charge to look at a specific individual predetermined change.

Step 2 - Assemble a Team for the Scenario Planning

You always want this done by a group and you always want that group to be as diverse, in terms of viewpoint and experiences, as possible. The whole point of scenario planning is to get people thinking about something that hasn't happened but that could happen. You do want someone there who is an expert on doing things the way we have always done them so that the process doesn't go totally off the rails looking at solutions that are impossible to execute, but you are looking for mostly or even



totally new responses. Most often the thinking of people who are not totally in the weeds can spark ideas about new solutions. Specific roles of the participants on the team should include Leader/Facilitator, Subject matter experts, stakeholder and risk manager. Someone needs to be responsible for documenting and communicating the process and finally, the folks whose role is to provide the variety of perspectives.

Step 3 - Identify Potential Drivers of Change

Going back to the last element of the scope discussion

Scenario Planning in 10 Steps (cont'd)

above, if the Scenario Planning Exercise is targeted to a particular change, then the group will need to work backwards and determine the drivers of that change. If asked to identify major change scenarios, then this task becomes identifying the drivers of change that might lead to some situation that has a major impact on the business of the company. These drivers could be economic, technological, political, environmental, demographic, competitive or other factors.

Step 4 - Develop Scenarios

I have often started a scenario development process by defining two or three different degrees of change for each of the Potential Drivers. Then I look at the possible combinations of those situations. For example, I was looking at Level of Debt, Climate Change, Demographic Changes and Technological Developments as four drivers. Then I looked at three levels of change for each. Things get better, stay the same or get worse for Debt and Demography. Things stay the same, get worse or get much worse for Climate. Slow development, moderate development, and rapid development for Technology. There are 81 combinations. From those combinations, I would then pick 8 - 10 different combinations and look to choose three or four for the planning exercise. I often use the idea that I have described previously of looking at three levels of likelihood in making my choices - normal volatility, realistic disaster and worst-case scenarios. Care should be taken to involve all of the diverse voices from the team in the process of envisioning and choosing the scenarios to work with.

Step 5 - Analyze Impact

With a short list of scenarios in hand, the group would now proceed to analyze the potential impact of each scenario. If this exercise is for an insurance company, the impact on Growth, Profits, Assets, Claims, Reserves, expenses, and overall employment would be assessed by the team. It is good to have some scenarios that result in little trouble to the company, some that might disrupt earnings significantly and some that might threaten the adequacy of capital. Disruption of plans in other ways should be considered as well.

Step 6 - Identify Early Warning Signals

While the team has their heads under the hood, looking at the details of the scenarios, it is helpful to think about the signals that could be a warning sign that a major problem is on its way. This is why the three levels of likelihood are helpful. They can be used to identify these early warning signals. The scenarios are all imaginary right now, but we will need to know when one might be becoming real so that we can prepare.

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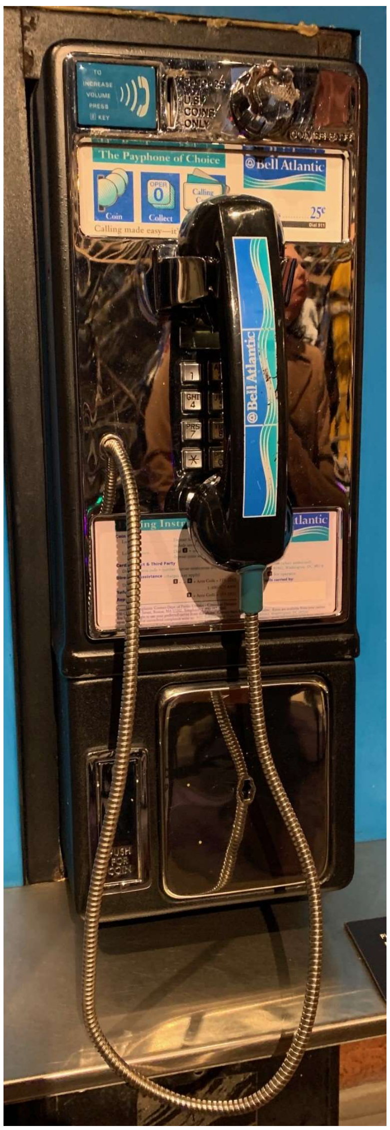
Scenario Planning in 10 Steps (cont'd)

Step 7 - Develop Strategies

For the scenarios that show significant adversity for the company, the team will develop potential strategy shifts that would reduce the adverse impact of the scenario. That might involve small modifications to existing strategies, or it could require stopping one or more of the main strategies either temporarily or permanently or adopting a new approach to risk mitigation.

Step 8 - Stress Test the Strategies

For each scenario where an alternate strategy is wanted, the potential strategies need to be assessed, looking at the same factors that led to the concerns about the scenario in the first place. If strategies fail to resolve the concerns, then go back to the drawing board to look for alternate strategies that try different changes to company strategies and risk mitigations or at least more of the same changes.



Step 9 - Communicate the Findings

Communication of the findings of a scenario planning process must get the audience to understand the concerns raised from the scenarios and the importance of the strategies that are found to alleviate the issues from the scenarios without making them listen to a blow-by-blow description of the entire process. The findings of the process need to be simplified down to a few short insights. The stories of the scenarios and the reasons why the company needs to pay attention to those scenarios should be told. Finally, the suggestions of the triggers that the company should be on the lookout for, along with any other suggestions of any other sorts of readiness that is needed.

Step 10 - Implementation Guide

Finally, if in the planning process the company decides to accept the recommendations of the Scenario Planning Team and to incorporate the idea of readiness for one or several of the scenarios that were studied, the team needs to prepare a preliminary Implementation Guide for the alternate strategies to include detailed instructions on how to put those changes to strategies or new strategies and mitigations in place. It is recognized that it is highly unlikely that whatever happens will not match up exactly with any of the studied scenarios, so these implementation plans should also indicate likely places where they will need to be modified to reflect the actual situation on the ground.

This is a quick summary of the steps to a Scenario Planning process.

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Vector Borne Illnesses

The Vector Borne Illnesses (VBI) range is expanding northward as temperatures warm and winters trend shorter and less harsh. In the US, the range is expanding in Florida and other southern states as temperatures warm. Reproduction is boosted as temperatures rise. Ticks and mosquitos both prefer their surroundings moist. In New England, reforestation of areas previously cleared for farming provides additional habitat for deer and mice, followed by ticks and mosquitos (ecosystem disservices). Mosquitos can be controlled by reducing areas for stagnant water to accumulate. Chemicals can be sprayed, and genetic modifications introduced to limit reproduction, but mosquitos have proven that they are adaptable.

Current Status

There has been some success in reducing the number of deaths from malaria in Africa, especially in rural settings, but the mosquitos have evolved with people and are moving and adapting to life in cities. New mitigation strategies will need to be developed. South America currently is suffering through another dengue outbreak. The United States continues to see expansion of Lyme disease, and mosquito vector diseases are spreading north as warmer winters fail to limit their range. Zika virus, which is significant to pregnant women and can cause birth defects including small heads, has resurfaced in Brazil and should be monitored closely for cases elsewhere.

Preferred protection includes insect repellant, covering skin with clothing when outside, and use of protective netting while you sleep. Checks for ticks should occur on humans and pets immediately after outdoor activities.

Arthropods are invertebrates with jointed legs and a hard exoskeleton. VBI are spread by hosts that include ticks, flies, fleas, lice and mosquitos. Some carry pathogens (e.g., virus or bacteria) from a reservoir host, often a deer or mouse, or to those they bite opportunistically like humans.

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Vector Borne Illnesses (cont'd)

Ticks

Lyme disease is caused by a bacterium often carried by a deer (black legged) tick. It is found in the eastern half of the US. Symptoms include fever, rash and joint pain, and can last for months even after treatment. A dog vaccine is currently available but a human vaccine was pulled from the market 20 years ago due to lack of demand.

Lone star ticks, based primarily on the Pacific coast, can cause severe allergic reactions to red meat. Other pathogens carried by ticks can cause flu-like symptoms, blood clots and organ failure.

Ticks also infect pets, wildlife and livestock. They have been known to swarm cattle and literally suck all the blood out of them.

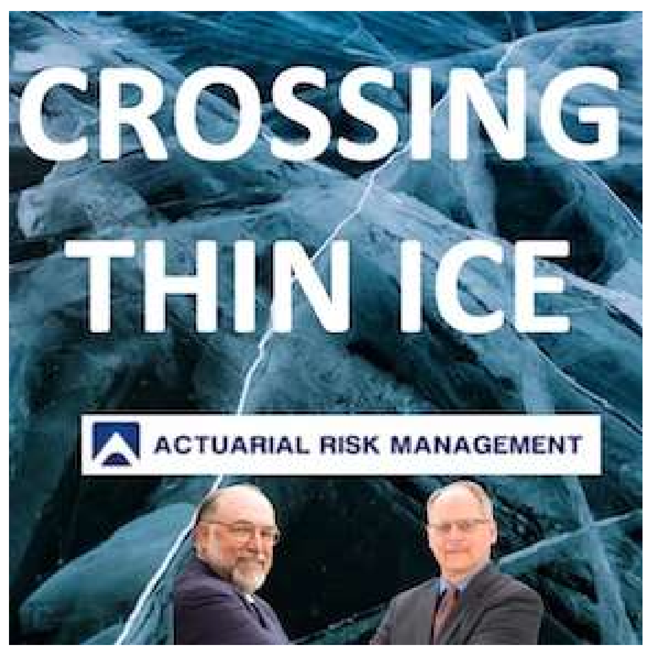
Especially relative to diseases borne by mosquitos, relatively few resources have been allocated to managing or eradicating tick-based diseases so far, even though cases are growing exponentially.

Mosquitos

There are quite a few pathogens (e.g., virus, parasites) transmitted by mosquitos. In North and South America diseases include chikungunya, West Nile, yellow fever, Zika, dengue and encephalitis. Globally malaria is the top concern, especially for children in sub-Saharan Africa. Symptoms range from flu-like to neurological, with many asymptomatic but some deaths. Most mosquitos do not carry these diseases. Some vaccines are available, with funding provided by governments and NGOs.

Visitors should always utilize existing vaccines, so they don't bring new diseases back home with them to be spread in a new range.

Additional funding for VBI research could be used for vaccine development, genetic research, and general studies that look for and implement solutions.



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Insurers have faced challenges from inflation, high interest rates, high turnover and shrinking candidate pool, and the next few years will see a radically changing environment for insurers. We will be using the Crossing Thin Ice platform to identify emerging risks and delve into what we see as the drivers of future success.

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